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1960

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Gas pricing shifts to area ceilings . . . 11
New York may seek fuel oil licenses . . . 15
Drilling needs flexible compressors . . . 21
Alaskan drilling costs plenty . . . 24
Prices snag Canada's gas export plan . . . 30
Venezuela expects drop in oil income . . . 36
Plastic users seek technical data . . . 41
'Memo-motion' aids plant maintenance . . . 42
Marine hose sales face bright future . . . 44
Market prices depend on the customer . . . 48

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INSIDE Slant

LET REGULATORS RULE

The Interstate Oil Compact Commission is a body composed of governors of oil producing states and their official representatives.

Its functions are limited to the purpose of conserving oil and gas and preventing avoidable waste within reasonable limitations.

Because of its limited functions, its various committees should be headed by members of state regulatory bodies or their employees, just as the commission, itself, is composed of governors and their official representatives.

This is something that Gov. George Docking, of Kansas, recently elected compact chairman, should keep in mind when he picks chairmen of the various committees.

The leadership of the commission and its committees should be retained by those who do the regulating, not by anyone from industry.

This doesn't mean that others are not capable of doing the job just as well as or better than regulatory officials or their employees.

Our point is that, although industry representatives should be members of committees, they should not head them.

LeRoy Menzing
EDITOR

WE'LL ADMIT

there are many claims about many wellhead hook-ups and components. But if you want to take the puzzle out of your production equipment, ask the O-C-T representative nearest you about "The Standard." It is simply a combination of an O-C-T Casing Head, O-C-T Tubing Head, master valve of your choice, and O-C-T flow control.

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60-Second Summary / WHAT'S HAPPENING IN OIL

January 29, 1960

dept/INDEX

Production	21
Pipelines	30
Processing	40
Marketing	44
Washington	18
Statistics	47
The Market Trend	48
Key Prices	49
Editorial	52
International	35
Personals	46
Service & Equipment	50

The Federal Power Commission is using area guides to set price ceilings on new gas sales and on increases under existing contracts. The price policy is unofficial so far. . . . p. 11

•

"Good equipment, lots of horsepower, and good crews" are essentials in the search for oil in Alaska. In addition, comparisons indicate exploratory tests cost up to four times as much as in California. . . . p. 24

•

Prices are hampering plans to export Canadian gas to the U.S. An Ontario utility claims gas exports would push up domestic prices and endanger its competitive position. . . . p. 30

•

Increased use of diesel vessels is expanding the marine lube market. Diesels, which now comprise 40% of ocean-going tonnage, use more lubes than turbine-driven ships. . . . p. 44

•

A 5,000 b/d well has opened a new pay zone in the Persian Gulf's newest offshore field near Das Island. The field already has production in two other zones. . . . p. 35

•

There are still some problems in developing compressors for use in air drilling. One of the most complex: Developing a compressor with an operating range that available power units can use economically. . . . p. 21

•

Plastics manufacturers will answer their customer's pleas for more technical data. The Society of the Plastics Industry is coordinating an intensive educational program. . . . p. 41

•

Venezuela has forecast a 7.6% drop in its oil income for 1960. That's despite its prediction of a 4.5% increase in 1960 oil output. . . . p. 36

•

A novel data-gathering technique—called memo-motion—is simplifying and improving plant maintenance. It is a special photographic technique for studying existing work practices. . . . p. 42

•

Phillips Petroleum Co. is loading up its "all-purpose" computer. It's one of the oil industry's biggest, and is being used on a sweeping list of jobs. . . . p. 13

•

Rep. James Roosevelt (D., Calif) threw not one, but three divorcement bills into the hopper this week. Integrated companies could not maintain company-operated stations under one bill. . . . p. 44

Up to the Minute

SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK

January 29, 1960

Early reports show that oil company earnings in 1959 ran substantially ahead of the previous year. The largest company—Standard Oil Co. (N.J.)—this week estimated its consolidated net income at $626-million, equal to $2.91 a share, up 11% over 1958. The increased earnings were attributed to a record sales volume and "more efficient use of facilities in handling the higher operating levels attained." Total revenues from sales and investments reached a new high of $8,168,000,000.

Some companies are expected to report record earnings, despite the severe competitive conditions that characterized 1959 operations. Phillips Petroleum Co. already estimates its profit at a new high of $104-million, up 23% over 1958. "It appears that for the second straight year, Phillips has had a substantially better year-to-year earnings comparison than the petroleum industry as a whole," according to K. S. Adams, chairman, and Paul Endicott, president. They added: "We expect 1960 to be another record year in earnings."

Shell Oil Co. had a 14.6% gain in net last year to an estimated $147.4-million. Texas Pacific Coal & Oil Co. reported its 1959 net at $7,196,561, up 15.5%. And Commonwealth Oil Refining Co. reported that 1959 was its first profitable year since it started operating in Puerto Rico in 1956, with last year's net at $3,135,000.

•

Iowa may have its first oil discovery. H. P. Jesperson, president of H & L Oil Co., Omaha, says his Niewald No. 1 in Howard county, 9 mi. southwest of Cresco, pumped at the rate of 29 b/d on a 4-hr. test.

•

A government-sponsored research program to develop new uses for coal won the approval of the House Interior Committee this week. A measure authorizing the Interior Dept. to contract for coal research was given the green light after department officials assured the House group that the program had its "wholehearted support." Interior officials also promised that they would seek an additional $1-million to operate the program in its first year. They previously had allocated $1-million.

•

Petroleum purchases by U. S. military agencies may be down by 5.3% in the fiscal year ending next June. That's the indication of current reports from Interior's Office of Oil & Gas. It predicts that purchases will average 697,000 b/d in fiscal 1960 (the 12 months ending June 30), compared with an average of 736,000 b/d in fiscal 1959. Purchases are now programmed at an average of 705,000 b/d for fiscal 1961.

•

The first 320-acre spacing for a U. S. oil field was ordered in North Dakota this week. It is for the Rough Rider field in McKenzie County.

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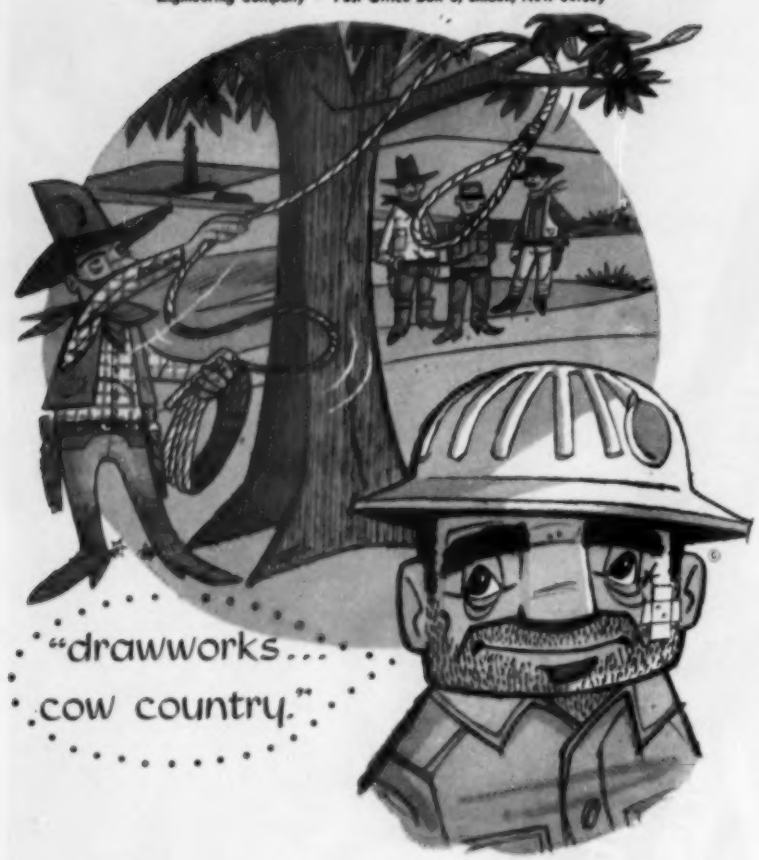

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DEPT/Opinions

Views That

"Far from increasing the [gasoline] tax again and extending it, Congress ought to remember that it promised American motorists last fall the tax would drop back from four to three cents July 1, 1960. Nothing should stand in the way of redeeming that pledge."

—FRANK M. PORTER
President
American Petroleum Institute

"In advocating a 'National Fuels Policy' that could deny freedom of choice, these [coal] people are threatening the very source of abundant, low-cost energy on which our civilization depends. But this is only a part of the story. Even more important, they are denying the system of free, competitive enterprise on which our way of life is based, and which we are committed to defend against the inroads of communism.

"Is it not paradoxical—even frightening—that in order to get a man to burn coal instead of oil in his furnace, we should be willing to invoke the very kind of state regimentation that communism represents? Since when has a ton of coal become of greater worth than an ounce of freedom? For myself, although I have cast my personal lot with the oil industry, I would sooner tear out my oil burner and go back to burning wood than be Sovietized bit by bit—whether by Moscow or Washington."

—KERRYN KING
Vice-president
Texaco Inc.

"When one reviews the violent swings from 'feast to famine' in the supply picture during the industry's 100-year history, I believe our faith in the long-range profitability of the oil business is fully justified."

—PAUL E. TALIAFERRO
President
Sunray Mid-Continent Oil Co.

"As much as we would like to have a [gas] bill that all industry groups could enthusiastically endorse, our committee reluctantly concluded that such unaniminity might come too late, if ever. Unless realistic legislation is introduced this year—legislation which has at least a fighting chance—we very much fear the FPC will be goaded into adopting the Zwerdling decision [in the Phillip's case] or some similar cost-of-service type of regulation for independent producers. Nor do we believe that chances are likely to improve next year, especially if no serious ef-

Make News . . .

fort is made now because 1960 is an election year."

—HARRY C. JONES
President
Texas Independent Producers & Royalty Owners Assn.

"The terrific competition for business, while it has been most valuable to the customer, has so limited profits from the sale of gasoline that balanced sales and service, including furnishing and installing tires, batteries, and accessories, are necessary to the dealer's survival. This is especially important to the substantial number of new dealers entering the service station field with little or no practical merchandising experience."

—DWIGHT T. COLLEY
Vice-president
Atlantic Refining Co.

"In the 1860s, when steam-propelled vehicles first appeared in England, the stagecoach and railway people acted like the coal producers are now behaving. They succeeded in persuading Parliament to enact a law requiring all power-driven road vehicles to be preceded by a man on foot carrying a red flag by day and a red lantern by night."

—OUR SUN
Employee publication
Sun Oil Co.

"The outlook for the West Coast petroleum industry is encouraging. After 2½ year of excessive inventories, the industry may again achieve a reasonably balanced supply, demand, and inventory position in 1960.

"Much of the improvement is the result of extensive dumping of products during 1959 at low prices in East Coast and Far East markets. . . . While competition for the available markets will continue as vigorously as ever, it now appears that prices will be firmer, though not yet at fully satisfactory levels in relation to increased costs."

—REESE H. TAYLOR
Chairman
Union Oil Co. of California

PETROLEUM WEEK *will publish each week comments from readers on timely, pertinent subjects. Such expressions are welcome.*

Address all such correspondence to LeRoy Menzing, Editor, PETROLEUM WEEK, *330 W. 42nd St., New York 36, N.Y.*

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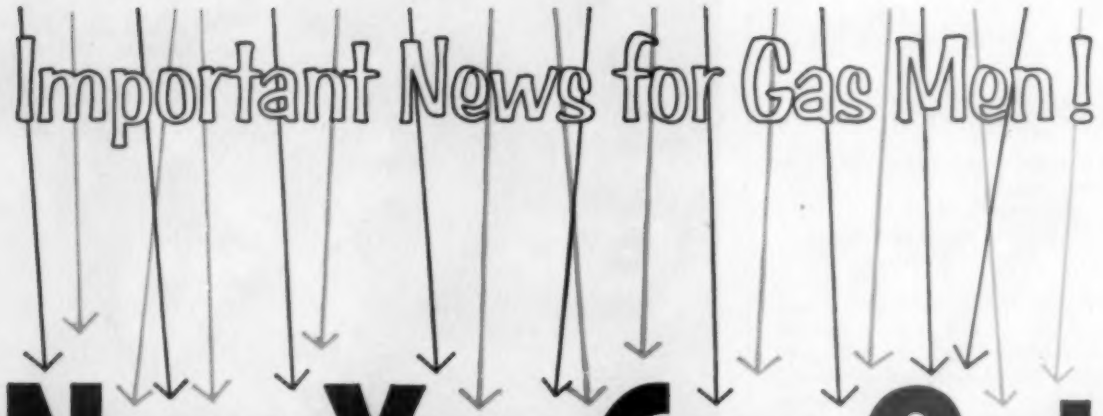

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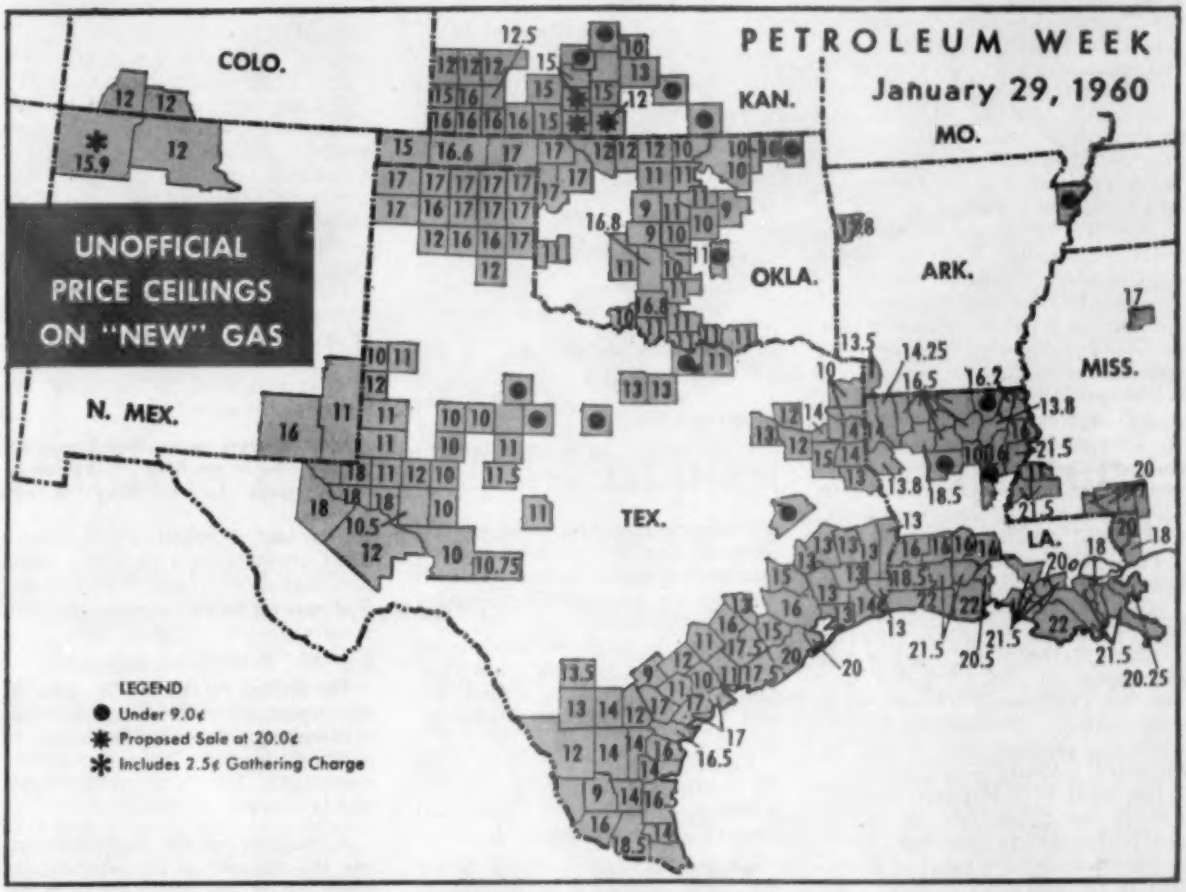


THE GAS PRICES SHOWN in these counties and parishes in major gas-producing areas are the highest initial prices (in cents per Mcf.) certified by the Federal Power Commission to date on an unofficial basis, as . . .

Gas Prices Go on Area Basis

The federal Power Commission has set up unofficial rule-of-thumb ceilings—based on area prices—to deal with natural gas producers.

Without issuing a formal policy statement, the commission is using area ceilings on both "certificate" applications, involving new contracts, and on rate increases to old contracts.

The commission started working out its area price formula in 1958, and Chairman Jerome K. Kuykendall concedes it is now being applied.

Says another commissioner: "Some of us would like to issue a statement on area-pricing policy, but there are still too many disagreements." However, enough agreement for practical use was reached in June, he says.

FPC then had some working figures as a guide through the maze of producer cases, to divide prices that must be questioned from those acceptable almost automatically.

While disagreement is one reason why FPC has not issued a policy statement, equally important is the fear that such a statement would set off a stampede of producers seeking to renegotiate their contracts up to the maximum.

The commission has two ceilings in major producing areas. The highest level applies to new gas reserves (table). A lower ceiling applies to gas prices under the now existing contracts.

The higher level allowed for new reserves to be committed for interstate sale reflects the commission's recognition of increased exploration and drilling costs.

Neither level is an out-and out price freeze. Some adjustments have been made in the ceilings since last June, and, in some cases, special exceptions have been made.

But attorneys representing natural gas producers agree that the top price a seller can expect for new gas is the top price that FPC previously approved, or certified, in the same area.

Should producers seek prices higher than the unofficial ceilings, there must be evidence to justify the price.

Presenting such evidence requires lengthy hearings and opens the issue

to intervention by interested parties, such as public utility commissions in consuming areas.

The FPC policy on new gas prices grew out of the U.S. Supreme Court's order last June, remanding the CATC-Tennessee Gas Transmission rate case back to the commission. The rehearings will start Mar. 15.

The CATC group of producers—Continental, Atlantic, Tidewater, and Cities Service—will try to justify a price of 22.4¢ per Mcf. including a 1¢-per-Mcf. state tax) for sales of gas off the coast of Louisiana to TGT.

"The [CATC] producers can prove a price twice that high with some cost-of-service evidence," one commissioner believes. But the producers indicated in a recent prehearing conference that they may contest the need for cost evidence.

The producers had turned down, an FPC-approved "conditioned" proposal for an initial price of 18¢ (including tax)—the highest price in the area at that time—to be increased to 22.4¢ after the first 24-hour delivery, under bond pending a hearing.

FPC then authorized the 22.4¢ rate without additional hearings.

That was the point of most concern to the Supreme Court. The most specific directive of the court to the commission in remanding the case was that FPC should consider prices more carefully, attaching "conditions" where the proposed price is not "in the public interest."

Just what level of prices is—or is not—in the public interest, or "of definite benefit" to consumers, is expected to be the key point of discussion in the rehearings.

In addition to the CATC case, two other cases bear watching as clues to FPC policy on new gas prices. The cases involve Trunkline Gas Co. and Transwestern Pipeline Co.

In the Trunkline case, the commission was convinced of the need for prices above the going level because of the stable contracts permitting no price increases for ten years.

The New York Public Service Commission objected, and the case is now before the District of Columbia Circuit Court of Appeals.

The commission's approval of the Transwestern application was its major ruling on initial prices since the Supreme Court sent back the CATC case. The FPC cut the initial prices, generally to the current area maximums.

Like the area price ceilings on initial contracts, ceilings on existing contracts are based mainly on historical prices.

Ceilings on Existing Contracts

The Federal Power Commission uses the following schedule of top prices (in cents per Mcf.) allowed for gas under existing contracts—rates acceptable without suspension in major producing areas:

TEXAS:

Southwest, Gulf Coast, and East	14¢
West	11¢
Panhandle	12¢

NEW MEXICO:

San Juan Basin	13¢
Permian Basin	11¢

OKLAHOMA and KANSAS:

All areas	11¢

MISSISSIPPI:

All areas	14¢

Producers operating under existing contracts can file for rate increases over the established ceilings, but such increases are automatically suspended by the commission.

Lengthy hearings are required on the suspended increase, and producers are required to refund any rate hikes that are not finally approved.

Figuring out the highest increases the commission will allow has become a vital game for lawyers. "Every mill counts," one remarked.

Bringing in cost evidence is regarded by lawyers as the surest way to break through these ceilings.

Some lawyers have noted benefits in the months the FPC has been using area ceilings in rate cases.

For example, FPC recently approved a settlement involving Union Oil Co. of California, which included an increase to 16¢ per Mcf. in southern Louisiana.

In this case, the majority was convinced by the commitment of added reserves to interstate sale and the elimination of favored-nations clauses from contracts. Cost evidence was also included.

More and more frequently, the commission has been ending old suspensions when the increases fall below the ceilings it has set.

In a few minor instances, it has ended suspensions on its own initiative.

But this process of ending suspensions when increases aren't out of line is due for a sharp test in a case involving Shamrock Oil & Gas Corp.

Commissioner William R. Connole consistently has held that FPC must follow through and prove an increase "just and reasonable" once it has been suspended.

Minneapolis Gas Co. agrees, and is battling the majority's view that it has a right to end suspensions in the court of appeals in Washington.

Such disagreements are signs of the FPC's persistent inability to get together on an over-all policy for producer rate-making.

Connole remarked recently, "We aren't any closer to agreement than we were two years ago." He said it would therefore be "premature" to issue an area-pricing statement.

Connole also apparently disagrees with the majority on the areas now being used.

He wants "a careful examination of costs as well as of the geological integrity of the areas."

Most lawyers agree that the area pricing now in use is no more than a rough guide for handling routine matters.

They say it reflects the commission's attempts to work out a complete area-pricing policy, but insist the final answers to big questions on producer regulation will come from Congress or the court.

The Phillips Petroleum Co. case is still expected to determine over-all rate-making policies for producers.

The Phillips case is now before the commission, but there are no signs that a decision is imminent.

A majority of the commissioners are still thought to be reluctant to apply utility regulation methods to gas producers.

Some still hope that Congress will relieve them of the chore.

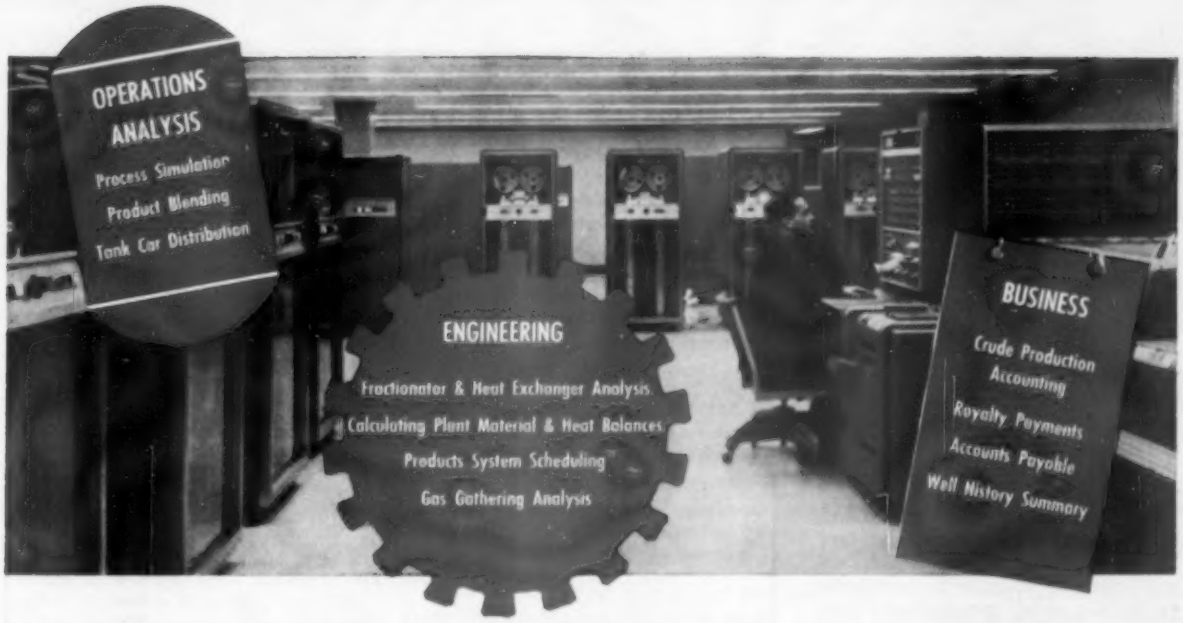
Some recent signs indicate the commissioners have open minds on producer rate-making.

The commission unanimously reopened a completed Panhandle Eastern Pipe Line Co. hearing to allow the pipeline to put in evidence of the market value of gas from its own fields.

One objection to utility-type rate-making recognized by commission members is that it can drive up prices.

One commissioner cites a case now before FPC involving a producer with unusually high exploration costs, who can justify, with a rate-base method, prices much higher than the ceiling in his area.

If the increase is accepted, the commissioner predicts, favored-nations clauses will be triggered, boosting prices throughout the area.



Phillips Loads 'All-Purpose' Computer

The company has created a 'computer department' to program full-time use of its large-scale computer on operating, engineering, and accounting problems.

Phillips Petroleum Co. is using one of the oil industry's biggest computers—an IBM 709—for a sweeping list of applications from operations analysis to engineering and business accounting.

Phillips is now rounding out the first year of work with its large-scale computer at Bartlesville. Specially designed to solve both technical and business problems, the machine has its greatest value in handling calculations so complicated or of such large volume that it would be impractical to tackle them without it.

The company recently began simulating a third refinery on the computer as one of its operations-analysis programs.

Phillips is developing simulations of a fourth refinery, several chemical plants, a central fractionating complex, and a uranium mill.

Processing simulation, on a case-study basis, puts the entire operation of a plant into the machine in one formulation. It then makes possible determination of the most economical method of plant operation by comparing the results of a series of cases that assume operation of the plant in various ways.

Operations-analysis programs now being run by Phillips, in addition to refinery simulation, include motor fuel blending by areas, fertilizer blending, and LPG tank car distribution. The latter involves control of daily shipments from about 70 sources to about 1,400 destinations. Modifications of this program are being used for distribution planning studies. A similar program is being developed to control ammonia tank car shipments.

Phillips is now running seven programs under its engineering category, including four having to do with design and analysis of processing equipment.

• The fractionator program is used by all departments that design or operate plants, and is used both for analysis of the operation of existing fractionators and the design of new ones. A small program is available for Phillips' medium-scale IBM 650 machines and a larger one for the 709. The latter program also handles absorbers.

A 709 program for the analysis and design of heat exchangers also is used by nearly all operating departments.

• A program for calculating plant material balances allows the design engineer to specify a complete plant flow diagram with such process equipment as fractionators, absorbers, strippers, heat exchangers, and reactors. The computer then works out material and heat balances. Changes in the flow pattern can easily be made, and the effect on plant balances calculated.

• A cracking furnace program uses basic furnace data such as tube size, number of tubes, tube length, and wall thickness, together with either an estimate of heat flux or gas temperature, to calculate changes in feed conversion and furnace skin temperatures. A major application is in determining the conversion level that produces the most valuable product yield.

• The chemical reaction equilibria program uses fundamental thermodynamic data to calculate equilibrium yields in all types of reaction systems. The program will handle as many as ten different reactants, and any number of consecutive or simultaneous reactions.

• Other engineering programs include gas gathering system analysis, products gathering system scheduling, and compressor simulation.

Included in the larger business programs now being handled on Phillips' 709 are crude oil accounting, accounts payable, individual well production, and well statistics. Additional programs nearing completion are gas accounting and refined products sales accounting.

• Oil accounting, previously handled on a 650, was transferred to the 709 because of increasing loads and to permit some savings.

Briefly, the program is this: Beginning with run tickets and going through increment tables, barrels are determined and, using formulas, calculations made correcting for gravity, temperature, and basic sediment and water. For master price and tax tables, the gross and net value, production, and excise tax are calculated, and tax

reports prepared. The revenue is split, establishing royalty and working interest amounts. Where required, withholding taxes are calculated. Preparing monthly payment checks and statements now requires only six hours on the 500-line-per-minute printer.

• The present 709 program for accounts payable consists of setting up a magnetic tape record for each invoice, with checks written on the discount date or at some prearranged settlement date. The program, previously handled primarily as a manual operation, provides purchasing statistics and an improved means of forecasting cash requirements.

• In the 709 program for individual well production, basic monthly test and operating data on each well and production from each lease, tank battery, or meter are fed to the 709, and (with appropriate formulas) the production of oil, gas, and water from each well is determined.

• Another program is a well history summary record, reflecting significant data on each of Phillips' 9,000 net oil and gas wells, plus service wells, from completion to date. The record is updated monthly by incorporating the changes on magnetic tapes.

Phillips has set up an independent computing department, which handles computing and data processing operations on a "closed shop" basis, with all other departments being regarded as "customers."

Computing personnel are free to use whatever machine fits the problem best—electric accounting machines 650 or 709. The 650s for example, continue to be used for small technical problems as well as for business problems.

Computing department personnel work closely with other departments in determining what areas have the greatest potential profits through computer applications. Once an application is selected for development, the other departments assign full-time personnel to work with the computing department.

Operating departments furnish all the knowhow on the problem, and the computing department furnishes the knowhow on the computer. Once a program is developed, the manner in which the problem is run is according to the wishes of the "customer."

In the realm of engineering applications, the computing department initiates and develops programs for the use of all departments. These general-purpose programs, which include such problems as the design of fractionators, heat exchangers, and gathering systems, are developed with the cooperation of various operating departments.

Producers' Costs Continue High

(Millions of Dollars)

	1944	1948	1953	1955	1956
TOTAL COSTS of finding, developing, and producing oil and gas, excluding income taxes, interest, and dividend payments	$2,123	$3,841	$6,448	$6,471	$7,003
GROSS REVENUES from oil and gas production, other lease revenue, and royalties	2,011	5,044	6,471	6,872	7,320
PROFIT or (LOSS) before taxes, interest, and dividend payments	(112)	1,203	23	401	317

Here's How Funds Were Spent

(Including Capital Outlays)

Exploration					
Dry Holes	274	462	797	774	909
Lease Acquisition, Geological and Geophysical, Other	327	570	987	651 / 306 / 263	561 / 360 / 287
Total	601	1,032	1,784	1,994	2,117
Development					
Producing Wells	593	1,058	1,762	1,826	1,959
Equipment	203	362	483	426	477
Total	796	1,420	2,245	2,252	2,436
Production					
Production Taxes	—	—	—	258	278
Ad Valorem Taxes	—	—	—	166	169
Other	—	—	—	1,183	1,331
Total	566	1,097	1,846	1,607	1,778
Overhead					
Exploration	44	79	172	189	208
Development	55	98	174	197	212
Production	61	115	227	232	252
Total	160	292	573	618	672

Here Are the Revenue Sources

Oil and Gas Production	1,909	4,805	6,132	6,671	7,095
Other Lease Revenue	9	13	20	23	24
Royalty Payments Received	93	226	319	178	201

Producers' costs for oil and gas exploration, development, and production went up 8% in 1956, while gross income dipped slightly below the 1955 level.

These findings were made by the American Petroleum Institute, the Independent Petroleum Assn. of America, and the Mid-Continent Oil & Gas Assn., in a newly completed joint survey.

The latest report is similar, but not exactly comparable, to the previous study, which covered 1944, 1948, and 1953 expenditures.

The main difference is that the 1955 and 1956 costs were analyzed in relation to the value of oil and gas production, while those in the earlier years took only crude into consideration.

Even though gross income exceeded expenditures, the picture is not as rosy as it would appear. Expenditure figures do not include federal, state, and local taxes, interest payments, or returns to investors.

"If these were included," the joint report noted, "total outlays would have been greater than total receipts in those years."

New York Fuel Dealers Face Licensing

Charges of fraudulent deliveries to customers may lead to licensing of fuel oil dealers in New York City.

The charges, made public last week, accuse dealers in Brooklyn of pumping air from empty compartments in tank trucks into consumers' tanks. The air passing through the trucks' meters registered as oil, and caused illegal increases in bills by as much as 10%, according to Brooklyn District Attorney Edward S. Silver.

Employees of several of the accused dealers have already admitted giving bribes to at least two inspectors of the New York City Bureau of Weights & Measures, according to the district attorney.

This week prosecutors were investigating dealers in the other four boroughs of New York, and in neighboring Nassau County on Long Island.

So far, the investigation reportedly involves fewer than 50 distributors (of approximately 1,500 in the New York metropolitan area).

City officials feel licensing is required to prevent fraudulent distributors from remaining in business and continuing their illegal deliveries.

Present methods of fining dealers for cheating on deliveries are inadequate, say Silver and Louis I. Kaplan, Commissioner of Investigations.

Their view is that fines fail to prevent dealers from continuing to defraud the public. By requiring dealers to submit to licensing, the city would be able to examine books and records more closely and to put violators out of business.

At present, the city Bureau of Weights & Measures can levy fines of up to $100 on businessmen who are found using inaccurate meters.

Corporation Counsel Charles Tenney told PETROLEUM WEEK that he is reviewing a licensing bill that was introduced in the City Council in 1954 but died in committee.

New York fuel oil distributors and suppliers do not view licensing as an answer to fraudulent delivery practices.

Just as the present investigation was caused by corrupt city officials, so licensing is subject to the same corruption, says one oil distributor. More emphasis should be placed on controlling the Bureau of Weights & Measures, he says, which has been involved in a series of scandals.

One supplier notes that licensing will not prevent unscrupulous drivers from cheating their employers. (In the present investigation, several drivers were accused of bootlegging oil on their own to other concerns after they had cheated the consumer of the oil.)

Bob Gray, president of the National Fueloil Council, does not view licensing as a remedy. Rather, he calls for more strict supervision of city officials. The call for licensing is just a means of "keeping the thing alive," says Gray.

What's More Important — Oil or Potash?

Two Utah state commissions will meet next week to decide whether drilling for oil and gas conflicts with mining for potash —or vice versa.

Essentially, this is the immediate problem: Is it safe to mine a potential potash ore body between 1,500 and 2,000 ft. by blasting, when casing from oil and gas wells tapping deeper resources runs through the mining operations?

The Utah State Land Board and the Utah Industrial Commission have called a session Feb. 2 to decide the question.

The issue could be an ultimate test of the concept of multiple use, with the state deciding whether it is better to develop an industrial mineral resource than a potental oil and gas field.

Both the U. S. Government and the state have issued potash leases and oil and gas leases covering the same areas.

The Industrial Commission may, however, on the basis of protecting miner's lives, assert a priority not only on points involved in a state-issued lease, but also on federal oil and gas—or potash—leases as well.

The area involved is near Pure Oil Co.'s discoveries at Big Flat and at Northwest Lisbon—southern Grand and northern San Juan Counties—which also are the sites of potash prospect and development.

Another oil firm, Delhi-Taylor Oil Co., has proposed a multi-million-dollar potash program at Cane Creek, an oil area in Grand County.

And in northern San Juan County, still another oil firm—Superior Oil Co. of California—has discovered a substantial potash deposit.

FPC Renews Bid for 'Producer' Gas Bill

The Federal Power Commission this week reaffirmed its position that natural gas producers should be exempt from utility-type regulation—a stand that gives new hope to producer associations seeking such legislation.

The commission's stand was spelled out in its annual report to Congress on its operations in fiscal 1959—the year ended last June 30.

FPC's general position on remedial legislation for producers was unchanged from the stand it has taken previously. The commission has consistently called for amendments to the Natural Gas Act of 1938 that would assure consumers of adequate long-term supplies of gas at "reasonable prices."

And one prime key to assuring adequate supplies, the commission has maintained, is freeing producers from restrictive, utility-type regulation.

Specifically, the commission is urging that its authority to fix producer rates on an area basis be spelled out "with greater particularity."

The commission proposes to substitute detailed area pricing guides for any mandatory requirement that it consider cost of production or revenues from "associated" products in determining gas prices at the wellhead.

Actually, the commission has been using area pricing guides for several months (page 11), even though they are not contained in the official commission policy.

FPC also reiterated its proposals that pricing or evaluation of gas in the field be on a commodity basis, and that "favored nation" escalation clauses be banned in producer contracts.

Some recent contracts signed by producers have eliminated escalation clauses. But producers generally are in favor of such provisions.

ANALYSIS

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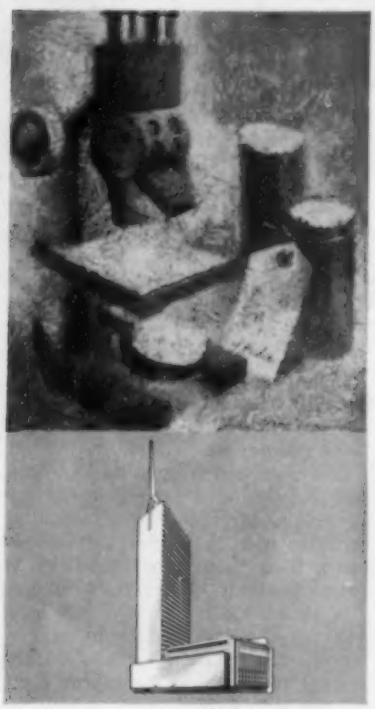

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What's New / IN THE INDUSTRY

The court test of Texas' severance beneficiary tax on natural gas is scheduled to start in Austin, Feb. 15. Judge Jack Roberts, of the 126th district (state) court, will hear the case brought by six natural gas pipeline companies challenging the constitutionality of the 1.5% levy on the "first purchaser" of Texas gas. The levy was passed last August at the legislature's third special session of the year. Disagreement over the nature of a "producer" tax as opposed to a "pipeline" tax defeated the gas tax proposed by Gov. Price Daniel in the regular session and two special sessions. The six contesting companies are Transcontinental Gas Pipeline Corp., Northern Natural Gas Co., Natural Gas Pipeline Co. of America, Michigan Wisconsin Pipe Line Co., Permian Basin Pipeline Co., and Panhandle Eastern Pipe Line Co. All told, nearly 50 gas purchasers have filed suits for refunds.

•

The Tulsa trial prompted the American Petroleum Institute to defer a planned executive committee meeting for a month. The meeting had been scheduled for next Friday. But since many industry executives expect to be in Oklahoma, or standing by for calls, it was decided to postpone the meeting to Friday, Mar. 4. The Tulsa trial opens Monday.

•

Union Oil Co. of California and Ohio Oil Co. are considering selling liquefied natural gas overseas. The companies, which have found gas on Alaska's Kenai Peninsula, have a joint delegation in Japan studying the possibilities of developing markets in the Far East.

•

The Kansas Corporation Commission has set the February allowable at 330,000 b/d, unchanged from January. Nominations for crude also were unchanged from January.

The commission has taken under advisement a proposed rule to require purchasers to take ratably from all wells to which they are connected in one field. Feb. 1 is the deadline for suggesting changes in the proposal drawn up by the commission staff.

•

The Independent Petroleum Assn. of America is setting up a special committee to study "unhealthy conditions" in the oil industry. The study will include imports, prices, costs, conservation practices, well-spacing problems and drilling rates and practices, oil and gas tax policy, natural gas regulation, competition between fuels, and "other pertinent subjects."

•

Oil Centennial Inc., wound up $25,000 in the black after all the celebration last year. The surplus has been turned over to the Drake Well Memorial Park, in Titusville, Pa.

•

All divisions of Monsanto Chemical Co. will be headquartered in St. Louis, Mo., by mid-1961. The company last week announced that administrative and office employees of the Lion Oil Co. division at El Dorado, Ark., will move next year, as part of the company's long-range plan to centralize all divisional headquarters groups. Production and exploration department employees now in Houston will not be involved. The company had previously made a similar statement on transferring administrative personnel from its Plastics Division at Springfield, Mass.

Two Beauties for Butadiene

"Cool" is the word for these ellipsoids . . . they're built to store butadiene at just-above freezing temperatures, which in Texas means about 45° below ambient temperature. They're 60 feet in diameter and 62 feet high, with storage capacity of 40,000 barrels each.

Butadiene is a problem child when it comes to storage. Vessels must be cold-storage as well as safety-vaults. Operating in an ambient temperature of 80° F the butadiene liquid in these twin ellipsoids had to be refrigerated to 35°F at 10 psig so that it could be kept "indefinitely."

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
January 29, 1960

The Federal Power Commission's feelings about income tax deductions in pipeline-producer rate-making are anything but harmonious. In the United Fuel Gas decision last weekend, the commission split sharply, with two dissenters assailing the majority opinion from opposite viewpoints. The majority upheld an examiner's ruling that the company should have the benefit of liberalized depreciation computing its cost of service, but overruled his decision disallowing the benefits of percentage depletion and the expensing of intangible drilling costs. The majority ordered a $2,172,224 refund covering the period Jan. 1, 1956, through July 13, 1957. It led one FPC observer to comment: "First the commission gave United the deductions; then it took them away."

In another case, a price cut ordered by FPC has resulted in another big batch of gas being pulled out of the interstate market (PW—Jan.22'60, p15). Phillips Petroleum and Union Producing rejected the FPC certificate authorizing them to sell 20-million cf/d from the North Henderson Unit, Rusk County, East Texas, to United Gas Pipeline Co. Phillips asked for 17¢ per Mcf., but FPC set the initial price 2¢ lower. So Phillips changed its mind and sold the gas intrastate, to Lone Star Gas. The intrastate price wasn't disclosed.

•

Congress will consider several tax matters relating to oil this year—in addition to the proposed ½¢ hike in the gasoline levy. The latter still has little chance of passage.

Taxing of co-ops—including those marketing oil—will come up again next week before the House Ways & Means Committee. Main idea is to figure some way to tax co-op patronage refunds, either to the co-op or to members, whether paid in cash or certificates. However, since big co-ops that market grower's products would be hit by any legislation aimed at co-ops selling to farmers, odds are against anything being made into law this election year.

The corporate income tax rate of 52% will be extended another year, as it has been several times in the past. So will Korean excise rates on such things as automobiles and alcoholic beverages.

Deferral of U.S. taxes on overseas earnings stands a 50-50 chance. A version of the Boggs Bill, HR 5, is expected to get Ways & Means Committee approval in a couple of weeks. The committee is still divided on some vital details.

A tax treaty with India—to include tax sparing on U.S. firm's earnings—is figured to win Senate approval. India has invited foreign oil exploration. The treaty would defer U.S. taxes on the same amount of earnings India spares from its own taxation.

•

The Navy's tanker-chartering practices are getting caught in the crossfire between Israel and the Arab countries. A controversial clause gives the government the right to cancel if Arab block countries refuse to load a vessel because of the owner's previous trading with Israel. Senator Jacob Javits (R., N. Y.) has protested to Eisenhower, and Rep. Emanuel Celler (D., N. Y.) has introduced legislation to ban such clauses in any government charter.

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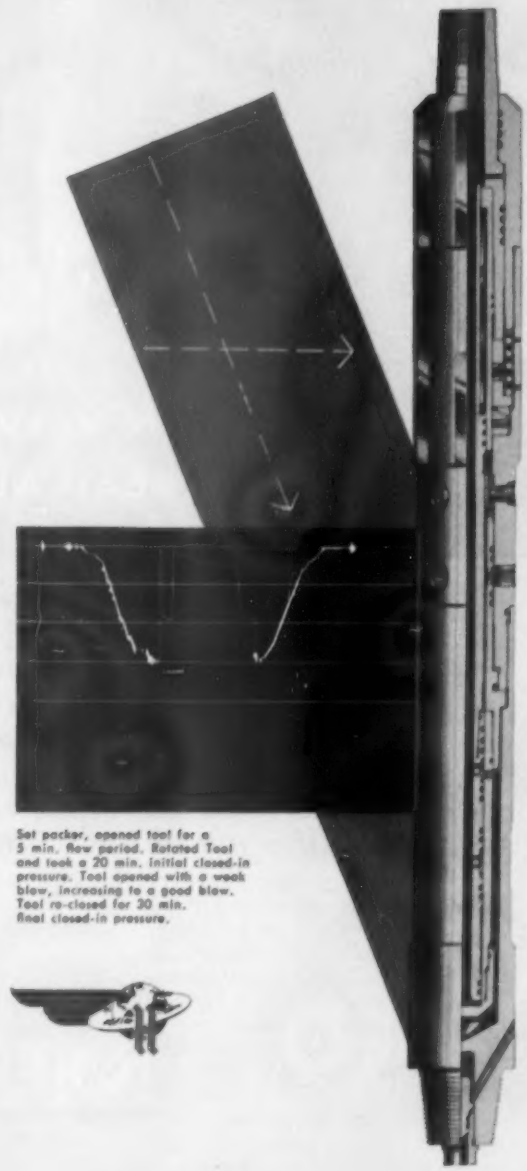
The design of the valve arrangement provides for closing in the formation for both initial and final CIP pressure periods and affords communication from the annulus to the drill pipe for reverse circulation after the test is completed. The Dual CIP Valve is assembled in the test string immediately above the Hydro-Spring Tester.

30 SECOND TECHNICAL DESCRIPTION

The tool incorporates a five-position sliding type valve—with spaced "O" rings moving past ports in the sleeve—actuated through a coarse left-hand thread mechanism by right-hand drill pipe rotation. The valve is locked against premature rotation by the jaw clutch held in place by the spring. The differential area of the design permits disengagement only when sufficient drill pipe weight is applied. Greater safety results, as the clutch is in the locked position while going in the hole.

After the desired interval for initial flow, the Dual Closed-In Pressure Valve is closed by rotation of the drill pipe 11 turns to the right for the initial closed-in pressure period. At the end of this initial period, the valve is opened by 14 additional turns to the right for the second flow interval of the test; then, at its conclusion, 14 more turns (right-hand rotation) again closes the valve for the final closed-in pressure interval after 16 additional right-hand turns.

Halliburton's Dual CIP Technique provides important data for the determination of static formation pressure, effective permeability of the tested zone, skin effect or damage factor, and production indices on flowing wells. *Now! the new Halliburton Dual Closed-In Pressure Valve helps to give you even more accurate reservoir evaluation information.* For your next formation test, call Halliburton—first!



Set packer, opened tool for a 5 min. flow period. Rotated Tool and took a 20 min. initial closed-in pressure. Tool opened with a weak blow, increasing to a good blow. Tool re-closed for 30 min. final closed-in pressure.

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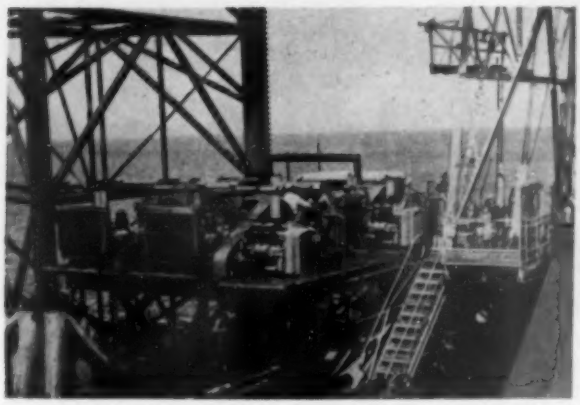
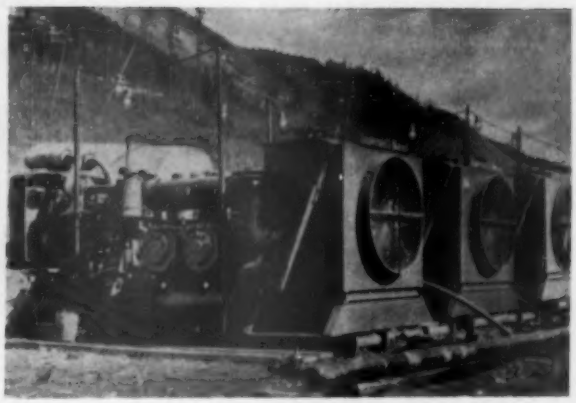




COMPRESSORS, shown mounted on an offshore platform (left) and on location in Alberta (right), are becoming commonplace as . . .

Air Drilling Boosts Compressor Use

Air/gas drilling, with the accompanying increase in the use of compressors, has become one of the outstanding technological changes in the domestic drilling industry in recent years.

It's estimated that there are nearly 400 air compressors in field service throughout the world today. Fewer than 50 are being used overseas. Foreign usage has been confined largely to North Africa, Turkey, and the Arabian Peninsula.

The heaviest concentration of compressors used for domestic drilling (U.S. and Canada) is contained in a 300-mi.-wide strip across North Texas, Oklahoma, and eastern Arkansas. The next heaviest concentration is in the Rocky Mountain area. West Texas and Canada are roughly tied for third spot.

An entirely new enterprise—that of the compressor rental contractor—has grown up around the technical concept of air drilling.

Such concerns supply oil companies and drilling contractors with compressors on a rental basis, together with personnel and associated equipment and materials, such as foaming agents, mist extractors, and drying agents.

There are seven such contractors presently operating in the U.S. and Canada. Two are based in Denver; the others are located in Casper, Wyo., Grand Junction, Colo., Midland, Tex., Oklahoma City, and Edmonton, Alta.

The rental contractors own approximately half of the compressors currently used in air drilling.

The rest are owned outright by contractors or by major oil companies that maintain their own rigs.

Companies that drill all or part of their wells with air expect, in most instances, to pay for compressor rental from the savings realized through their use.

Such savings can stem from faster penetration, reduced rig time, and improved bit life.

Compressors for air drilling must combine mobility, rugged construction, and reasonable efficiency through a wide range of operating pressures and conditions.

Soon after the advent of air drilling, compressor manufacturers experimented widely with various types of compressors to learn which might prove most practical.

Impeller types were given only passing consideration, because they normally are capable of compression ratios no greater than 2:1. The vane-type rotary compressor was considered, but likewise discarded because it did not provide sufficient flexibility for air drilling operations. (Operating pressures as low as 50 psi. and as high as 350 psi. are required.)

The axial-flow compressor, improved models of which are now on the drawing boards of manufacturers, may eventually satisfy the rigid requirements of air drilling. For the present, however, prototype models operate at exceptionally high speeds and are not adaptable to currently available oilfield engines.

Reciprocating piston-type compressors are by far the most common in air drilling service today. They are available in either single- or double-acting models, and with varied cylinder arrangements. Compression ratios as high as 8:1 can be maintained over continuous periods.

The most widely used reciprocating-type compressor is the vertical machine with W-type construction. This compressor has four low-pressure air cylinders and two high-pressure air cylinders in a vertical radial pattern for two-stage operation. The action is single, with air being compressed on the upward stroke of the piston in the cylinder.

The reciprocating-type compressor has some disadvantages, too. Compared with a rotary type, for instance, it takes up more space and has more moving parts, thus complicating maintenance. In some instances, valve wear is a big problem.

Developing a compressor with an operating range within which available power units can be used economically is one of the most complex problems yet to be solved, says William A. Triest, of Gardner-Denver Co.'s Dallas office.

Triest, speaking before a recent meeting of the Kansas-Oklahoma Waterflooders Assn., at Bartlesville, Okla., pointed out that "constant volume throughout a range of pressures is wasteful of available horsepower at the lower discharge pressures, and constant brake horsepower can be dangerous to the well when high pressures are required."

The answer, he said, "has been sought in drawing arbitrary limits beyond which one or the other path is followed."

The higher pressures required (up to 1,500 psi.) for aerated fluid programs or for jetting water and mud from the hole can be obtained by adding a third-stage booster.

Compressors usually chosen for this

purpose are horizontal, single-cylinder, double-acting machines with top suction and bottom discharge valves.

The volume of air delivered, regardless of the number of stages, remains the amount displaced by the first stage of compression and then moved on to the other stages. Thus, the relationship between the displacement of the first stage of compression and the actual amount of air which leaves the first-stage cylinder constitutes the actual efficiency of the compressor.

Booster adaptation is complex because it is limited to a predetermined range of volume and pressure.

Most air drilling is carried out by manifolding a battery of compressors alongside a rig fully equipped for mud drilling.

Air drilling, in this respect, is at an economic disadvantage with conventional fluid drilling—not because compressors cost more than pumps, but because compressors often represent additional rather than replacement equipment.

Compressors have been skid-mounted to suit virtually every type of air-drilling operation. They have been driven successfully with diesel, gas/butane, and electric power units.

The most common compressor unit is a self-contained package with power, water cooling, and controls mounted on heavy duty, four-section skids. Dimensions and weights vary, but all are designed to conform with the 8-ft. U.S. road-width limitation.

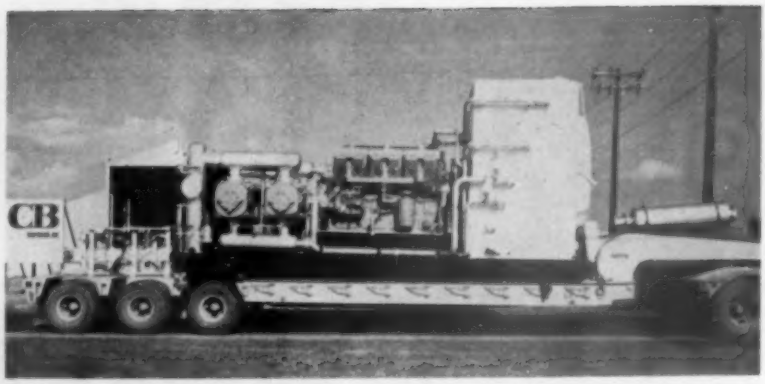
Compressor units equipped to be driven from the tail shaft of the drilling rig itself also have become popular in recent years, particularly in the East.

Since the compressor in this instance usually replaces the mud pump, it is powered by the mud pump drive. Two-stage construction is the rule, with pressure ratings up to 350 psi., and volume capacities rated (by the manufacturer) at from 500 to 2,000 cu. ft. per minute.

When multiple compressors are used on a rig drive, they are directly connected, or else driven through a conventional compound. Clutches usually are required to permit maximum flexibility and to reduce engine maintenance.

Prime movers, however, must be derated by 25% to 35% below maximum horsepower ratings. An engine that will pull a 600-hp. mud pump can be considered adequate for a 450-hp. compressor.

Since compressors operate continuously at peak load, much greater stress is placed on the power source. Moderate engine speeds are considered necessary to obtain long life and economic operation. Even so, rig expenses are higher with air drilling, because more load is placed on existing engines—or more fuel required for auxiliary engines.



TRUCK-MOUNTED Cooper-Bessemer compressor, rated from 350 to 500 hp., is designed for gas-gathering service, but can be easily adapted to air/gas drilling.

Because of the many rig-floor accessories, only about half of the rated horsepower of the rig engines can be devoted to air compressors. Rig engines generally have been found capable of providing about two-thirds of the air requirements. The rest must come from auxiliary engine-driven units.

Determining exact air-volume requirements for any given operation is a major problem for contractors and operators who use air drilling.

The conventional practice is to rent compressors on the basis of rated capacities assigned by the manufacturer. While these ratings may be accurate under factory-test conditions, their accuracy varies widely with altitude, atmospheric conditions, and the condition of the equipment.

In essence, the rental contractor sells his air by the machine—not by volume.

Most drillers base their estimates of compressor adequacy primarily on observed fill-up rates, or the quantity of cuttings entrained in the downhole air stream.

If dusting does not stop soon after the bit is taken off bottom, or if the driller cannot go back in the hole to total depth after making a connection, the compressor capacity is then assumed inadequate and additional units are assigned.

Too much air, on the other hand, results in finer cuttings and impedes drilling progress. Added to this is the obvious fact that superfluous air means that the operator is paying for a commodity that is not being used.

One major company is so concerned about the lack of accurate compressor ratings that it recently directed a corrective memo to its field personnel:

"Recent experience gained during drilling tests has indicated that ordering air from [rental] contractors on the basis of rated output capacity of the air compressor will not result in delivery of the desired volume of air to the well.

"Published compressor output ratings generally are taken from manufacturers' sea-level ratings, and are sometimes corrected for altitude and pressure—sometimes not.

"The output of a compressor at high altitudes decreases from its sea-level rating by the ratio of the absolute atmospheric pressure at altitude to the sea-level pressure of 14.7 psi. Likewise, the output varies from the manufacturer's rating by the ratio of the absolute ambient temperature to the standard temperature of 60F."

The memorandum cites two examples in which actual compressor output was measured by a 2-in. orifice well tester. In one instance, the volumetric efficiency was only 47%; in the other, only 45%.

The company memo concludes that bids for air compressor service should be solicited on the basis of guaranteed output, and the air delivery at well location should be checked by suitable metering equipment.

Metering is considered valuable, not only as a more equitable means of purchasing air, but also to build a meaningful backlog of information on which to base empirical studies.

To date, the only known instances of air being accurately metered have been on a few company-owned rigs, or where a major company has conducted research. This has resulted in operators being generally aware of how many compressors are required for air drilling in a specific area. But they have little or no knowledge of actual air volumes involved.

Operators are thus ill-prepared to

plan comprehensive future drilling programs, which may involve entirely different equipment, in other sectors of the country.

Guides, based on theoretical evaluations and laboratory investigations, are widely available. But drilling experts insist these cannot take into account all conditions encountered in the field. Researchers stress the need for more empirical information based on authenticated volumetric measurements at the well site.

Although actual air requirements are a moot point at present, there are definite indications of a trend toward increased compressor capacities.

A recent survey by a major oil company covered 200 wells drilled with air over a three-year period (1955-58). Specific instances were observed which showed air volumes (as indicated by manufacturers' rated capacities) increased by as much as 40% under similar drilling conditions, during the period covered.

Socony Cuts Marine Seismic Costs

A marine seismic system said to be from five to ten times cheaper than conventional seismic methods has been developed by Socony Mobil Oil Co.

F. J. McDonal, geophysical section supervisor at the company's Field Research Laboratory in Dallas, announced the new method at last week's meeting of the Dallas Geophysical Society.

McDonal said that many new developments have increased the value of seismic operations, but that there has been a significant cost increase at the same time.

"Many geophysicists," he said, "have questioned whether geophysics is pricing itself out of business."

But Socony's system, he believes, will be valuable as a reconnaissance tool at a cost of only 10% to 20% of that of conventional seismic prospecting.

The Socony method is a one-boat operation employing a detonation gun as the source of seismic energy for obtaining variable-density records in a repetitive manner as the boat moves at uniform speed.

The gun, which is supported over the side of the boat with the open end about 3 ft. beneath the water's surface, is fired at three-second intervals with a distance of 18 ft. between shots as the boat moves at the rate of 4 mph. (drawing).

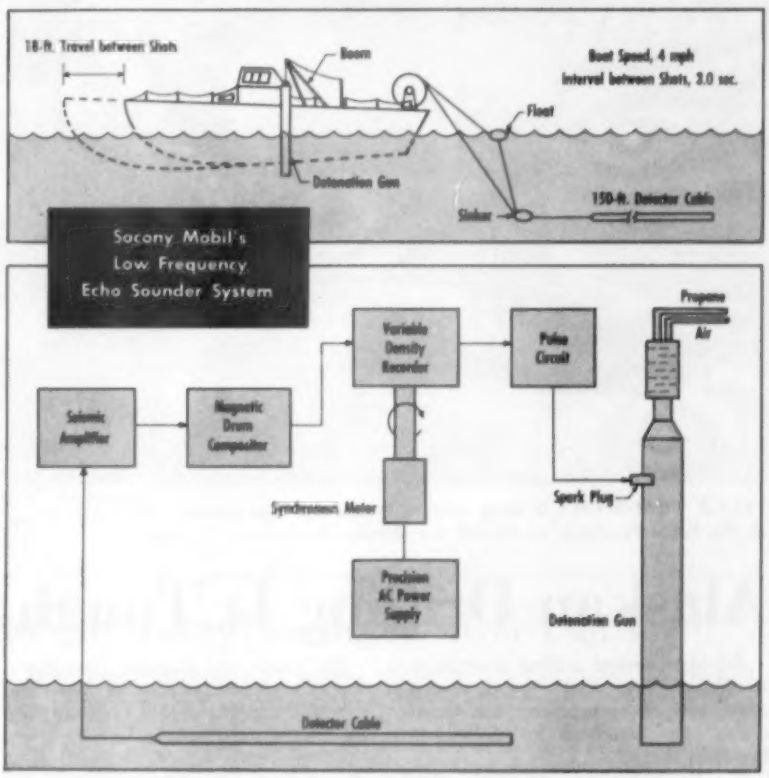
The gun is an iron tube about 20 ft. long and 2 in. to 8 in. in diameter. A fuel mixture of propane and air, or propane, air, and oxygen, is ignited by a spark plug in order to get the explosion.

The mixture of propane and air is not critical, but adding oxygen provides a wider range of satisfactory mixtures and increases the energy of the detonation.

At the moment of the spark, said McDonal, a burning front is created, and advances downward through the gun.

As the combustion proceeds, energy is added to the moving flame front, and the velocity of the flame front increases.

It eventually exceeds the velocity of sound.



The result is a shot wave that strikes the water at the submerged end of the gun.

The produced signal is not too much different from that made by dynamite.

A 150-ft. detector cable is towed behind the boat at a depth of 4 to 25 ft., depending on water depth, and is kept in place by a float and sinker arrangement.

Signals picked up by the detectors, which are connected in parallel, are amplified by a conventional seismic amplifier with a conventional choice of filter settings.

McDonal said the detector spread that is used may be considered as one trace of a conventional seismic system. But precautions must be taken to minimize noise from the boat and from the turbulence created by the cable which is being towed through the water.

To do this, the Socony system uses a detector cable with 20 elements to serve as a pattern for noise rejection, a streamlined plastic tube to house the detectors and associated cables, and a 150-ft. dummy section between the detector cable and the sinker.

So far, he added, the system was used in the Gulf of Mexico, and in bays along the coast, with the records "consistently showing good reflections from depths of 4,000 to 5,000 ft. and, in some cases, from 8,000 ft. or more."

"We expect," he said, "to be able to increase the power of the detonation gun and improve the performance of the rest of the system. This should result in improved records, with reflections from appreciably greater depths."

TRUCK TRANSPORT is being used to haul crude from Swanson River Unit field, on the Kenai Peninsula, to Seward, for ultimate shipments to California.

COASTAL DRILLING CO. RIG on Swanson River Unit is winterized.

Alaskan Drilling Is Tough and Costly

An experienced drilling contractor in Alaska says that "good equipment, lots of horsepower, and good crews" are essentials for drilling in the 49th state.

C. T. (Charley) Whitney, vice-president and general manager of Coastal Drilling Co., Bakersfield, Calif., has this advice for anyone contemplating a move to Alaska:

"Move in with a new rig, or practically a new rig, and with crews you have some history on. It will be cheaper in the long run."

Coastal, which was contractor on the Swanson River Unit field discovery 2½ years ago, now operates three of the six rigs working in the state (PW—Jan.22'60,p25).

The inventory of spare parts also has to be much higher than normal, he says.

"Your inventory of a rig going in has to be relatively complete on extra parts," Whitney warns. "It's not uncommon to have as high as $75,000 worth of extra, expendable parts for one rig."

He points out that any emergency supplies needed have to be flown in, which boosts, the cost of such supplies by at least one-third.

"We're now building up and sending a complete change of shafts (drum shaft, jack shaft, output-drive shaft, and pump-drive shaft), because of limited air express available to carry them in when they are needed," Whitney adds. Shaft trouble is not uncommon in Alaskan drilling operations, he continues, possibly because of the extreme temperatures, which may make shafts more brittle.

Working and living conditions are improving sufficiently to lessen the difficulty of recruiting top crews for Alaskan operations, he notes.

"We try to make it interesting enough to lure our best men out of our California spread," Whitney says. (Coastal operates three rigs in California.)

"We prefer married men. Now that schools are adequate, it is easier to encourage them to go. Improved working conditions at the rigs—better heating and winterizing equipment—also have helped."

Recreation is improving, too, says Whitney, with the opening of a new bowling alley and theater in Soldotna, and housing is better as construction of homes and motels proceeds.

"The biggest percentage of our people with children are active in PTA and other community activities," he adds. "We're well represented in the schools."

Whitney adds that there is "an abundance of opportunities" in Alaskan oil for young men.

The contractor has minimized equipment problems by setting up his own machine shop, at Soldotna.

"We're adding to it to make a complete oilfield repair shop," says Whitney. "We have lathes, presses, and grinders, and expect to bring in additional equipment."

The shop has proved so successful that it is now doing work for others. It recently was reorganized as Arctic Oil Tool Co., a subsidiary of Coastal Drilling Co.

WINTER WONDERLAND makes interesting photography, but weather and terrain complicate Alaskan oil exploration.

10,000-ft. Exploratory Test

Cost Approximations: Alaska vs. California

Item	Kenai-Peninsula (Alaska) Range Low	High	San Joaquin Valley (Calif.) Average
1. Road (10 mi., summer)	$ 50,000	$ 400,000	$ 30,000
2. Location (mat, sumps, water well, cellar)	20,000	50,000	10,000
3. Transport rig to Alaska (50 tons)	40,000	60,000	—
4. Haul rig to site (125 mi.)	25,000	40,000	15,000
5. Rigging up (cranes, fork lifts, crew)	20,000	30,000	5,000
6. Miscellaneous (conductor, lumber, etc.)	15,000	25,000	5,000
7. Drilling (includes direct supervision)	150,000	200,000	90,000
Contractor (60 days)			
Days to set surface pipe 7			
Days drilling 33			
Days coring, testing, logging 20			
Supplies	105,000	155,000	70,000
Bits—75			
Muds—250 tons			
Chemicals and Additives—50 tons			
Weighting material—100 tons			
Cement—5,000 sacks			
Fuel			
3,000 ft. of 13⅜-in. surface pipe			
Service companies (Fishing, testing, and coring tools; cementing heads; mud logging, electric logging, well surveying, pipe straightening, cementing, and miscellaneous other rented equipment.)	35,000	60,000	25,000
8. Return rig to California	40,000	50,000	—
Total If Dry Hole	**$500,000**	**$1,070,000**	**$250,000**
9. Complete well as producer 7-in. N-80 casing, 5,000 # Tree, 1½-in. N-80 tubing, 2-1,000 bbl. tanks and ICL	100,000	125,000	70,000
Total If economic volumes of oil found	**$600,000**	**$1,195,000**	**$320,000**

TYPICAL DRILLING PROGRAM (Swanson River Unit well)

1. Cement 20-in. conductor 4 ft. below cellar floor.
2. Drill 12¼-in. hole to 3,000 ft., then run induction electric log.
   a. Utilize gel mud, as necessary, to maintain open hole condition.
   b. Obtain one-half gallon sample of drilling fluid prior to pulling out for logging run.
   c. Potential scale 0-100 millivolts, resistivity scale 0-50 ohmmeters.
3. Open hole to 18⅝-in. and cement 13⅜-in. casing with sufficient calcium-chloride-treated construction cement to fill annulus to surface. Use guide shoe on 13⅜-in. casing with differential fill-up collar one joint above. Mount 13⅜-in. cementing plug on fill-up collar. (Estimated cement, 3,000 sacks.)
4. After standing cemented 12 hrs. install and test Class III blowout prevention equipment. Test to 1,000 psi. with clear water, to be witnessed by drilling representative.
5. Install mud logging unit and formation log as per logging program.
6. Drill for 7-in. casing to 10.750 ft.
   a. Drill 12¼-in. or 10⅝-in. hole as directed by drilling representative.
   b. Maintain sufficient gel mud weight to overbalance fresh water entry as required. (80 pcf to 100 pcf)
   c. Maintain water loss of 5 milliliters or less when drilling or coring below 11,000 ft.
7. Run induction electric log for correlation at 10,750 ft.
   a. Obtain one-half gallon sample of drilling fluid just prior to pulling out for logging run.
   b. Potential scale 0-100 millivolts.
   c. Resistivity scale 0.50 ohmmeters.
8. Drill ahead in 10⅝-in. hole to approximately 100 ft. above top of objective sand to approximately 11,850 ft.
9. Diamond core 8⅜-in. hole through objective sands to a total depth of approximately 12,650 ft.
   a. Run core analysis on each foot of sand; permeability, porosity and fluid saturations. Samples will be designated by the development engineer.
   b. Engineer will select applicable samples for capillary pressure determinations. These samples will be sealed and shipped to California Laboratory.
   c. Make drill stem tests as designated by engineer.
10. Run induction electric log 10,750 ft. to total depth.
    a. Obtain one-half gallon sample of mud prior to logging run.
    b. Potential scale 0-100 millivoltes.
    c. Resistivity scale 0.50 ohmmeters.
11. Run microlog caliper and continuous dipmeter surveys as directed by engineer
12. Drill stem test as designated by engineer.
13. Condition hole for casing as necessary.
14. Run 17-in. casing to total depth in accordance with accepted casing design centralizers on each second joint below 11,650 ft. Casing to be equipped with differential fill-up shoe and differential fill-up collar placed two joints above the shoe. Reciprocating scratcher should be placed to adequately cover intervals to be perforated for production and to isolate individual sands.
15. Cement casing with 600 sacks of retarder treated construction cement. Reciprocate casing to pass scratchers if conditions permit.
16. After standing cemented six hrs. run thermometric survey to locate top of cement.
17. After 16 hours, land casing according to standard practice and reinstall Class III blowout prevention equipment.
18. Clean out as required and run gamma ray power log and neutron log as designated by engineer.
19. Establish WSO's as designated by engineer.
20. Selectively jet perforate attractive sands with four jet holes per foot as designated by engineer.
21. Scrape 7-in. casing opposite perforated intervals.
22. Run 2½-in. tubing with packer and swab well to flowing completion.

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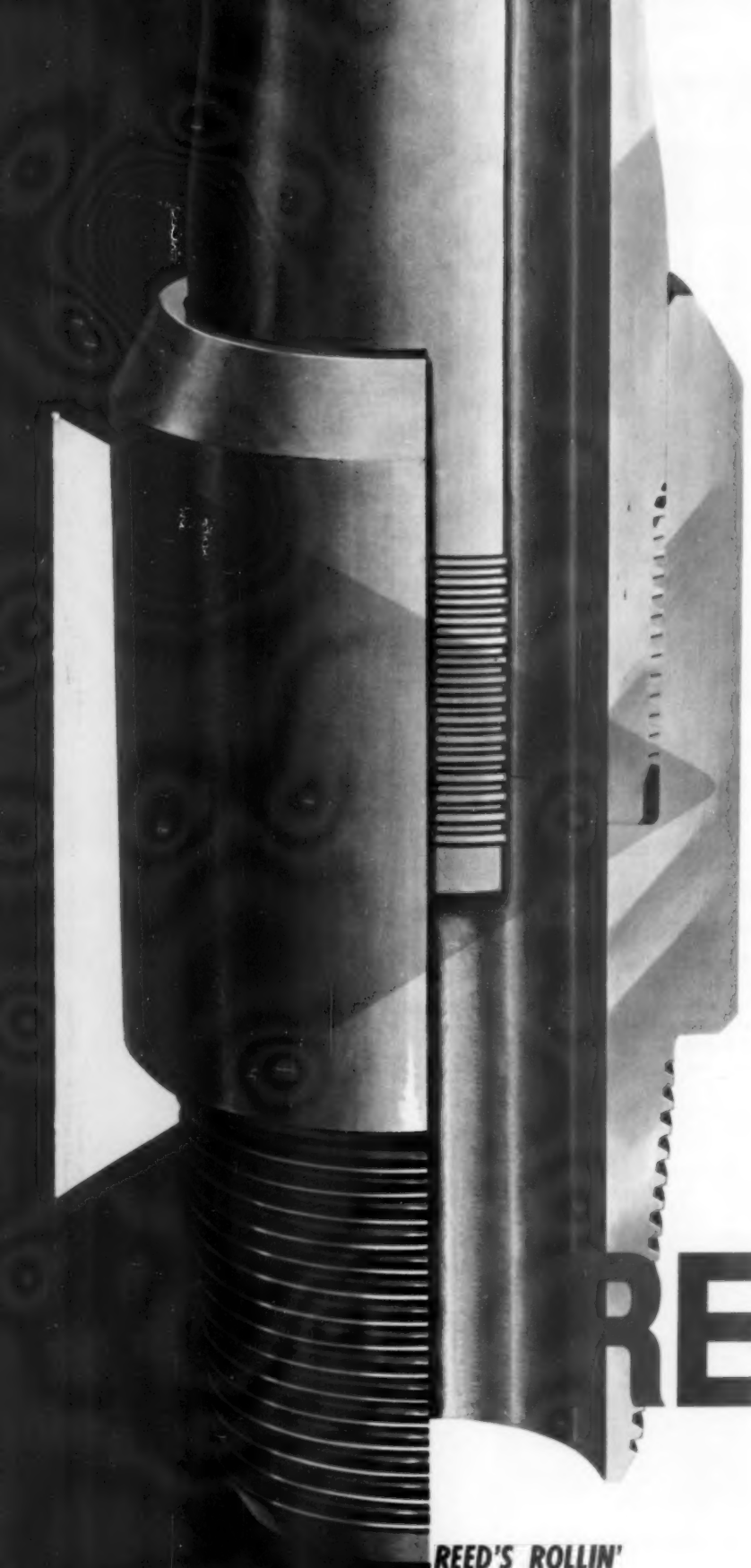

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Spraberry Flood Moves One Step Closer

The first of several planned waterflood programs in Texas' huge Spraberry Trend is scheduled to get under way by June 15.

Southland Royalty Co., which will conduct the initial flood, is going before the Railroad Commission to make its unitization request, now that the required percentage of working and royalty interests have agreed.

The proposed project, which covers an area of 15,776 acres, includes 110 upper and lower Spraberry producers in northwest Reagan County (PW—Jul.17'59,p18).

An additional 19-million bbl. of oil are expected to be removed from this flood, at an estimated cost of around $2.5-million. Five water input wells and two or three infield wells will be drilled for the flood operation.

Four other Spraberry flood projects have been announced—two by the Humble Division of Humble Oil & Refining Co., and one each by Phillips Petroleum Co. and Sohio Petroleum Co. Three more are in the planning stage.

Southland's program follows a drainage pattern study it made using Krypton 85, a radioactive isotope of the inert gaseous element.

The Spraberry Trend, which spreads over Reagan, Glassocck, Midland, and Upton Counties, has 3,000 producing wells, 2,000 of which are on artificial lift.

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A worldwide count of active drilling rigs may be undertaken later this year.

The count would be conducted by the American Assn. of Oilwell Drilling Contractors and the International Oil Scouts Assn. The plan hinges on IOSA agreement to the joint effort.

•

The discovery for the "north end" of the big East Texas field—completed 29 years ago this week—is still a hefty producer.

Arkansas Fuel Oil Co. and Pan American Petroleum Corp. No. 1-A F. K. Lathrop, W. M. Robinson survey, Gregg County, was completed Jan. 26, 1931, for 18,000 b/d.

In a special test this month, the well flowed 48.66 bbl. of oil in 1 hour through 2½-in. upset tubing with ¾-in. sucker rods in the hole.

It has produced 515,101 bbl. of oil up to Jan. 1, 1960.

•

More than 14,500 acres in 14 counties in the western half of North Dakota will be offered at competitive bidding Feb. 23.

The sale will be held in Bismarck by the Bank of North Dakota as trustee for the state treasurer.

Some 6,000 acres of the total offering are in McKenzie County.

•

Texas' Third Court of Civil Appeals has ruled that natural gas produced from a reservoir after cycling is subject to the same tax as other gas.

The ruling affirmed a district court decision favoring the state, which holds $116,720 paid under protest since July, 1950, by Francitas Gas Co. on dry gas produced from Francitas field, Jackson County.

Francitas completed its cycling operation before selling the gas, and paid taxes on liquids removed from the reservoir. The company contended that it did not owe additional tax on gas later produced for sale.

•

The Texas Subcommittee of the Oil Industry Conservation Forum has endorsed, in principle, the report by the West Central Texas Oil & Gas Assn. favoring wider spacing in newly discovered fields.

Harold Decker, president of Highland Oil Co. and chairman of the subcommittee, said, "It is the purpose of the Conservation Forum to foster and support ideas and procedures which will make it possible to lower the cost of producing oil and gas and still achieve maximum recovery.

"One of these ideas is to find ways and means of encouraging the establishment of proper-sized drilling units in newly discovered fields. This has sometimes been misconstrued as support of wider spacing in general, which is not necessarily the case."

•

Will This Be First South Carolina Oil?

A South Carolina farmer has discovered a "thick, brownish fluid" in a hand-dug water well, which he hopes will earn him the $100,000 reward offered by the state for the state's first oil discovery.

The farmer, Albert J. Stone, of Johnsonville, Florence County, in the northeast corner of the state, found the fluid when he reopened an abandoned well originally used to water cattle.

He gave a sample of the fluid to the town mayor, who gave it to a congressman, who in turn took it to the Federal Bureau of Standards in Washington, D.C.

Since the discovery, the volume of the oily substance has almost doubled in the well, which is about 20 ft. deep.

In the meantime, farmer Stone is hoping the government's report will bear out the mayor, who said, "It's some kind of oil."

Engineering

Two new products designed to overcome the paraffin problem in oil wells have been developed.

Dowell Division of Dow Chemical Co. is testing a method which involves a combination of chemicals plus a special preapplication technique. The chemical combination will make metal parts of the well water-wet, thus preventing adhesion of paraffin particles. Dowell engineers say field tests so far indicate that less than 3¢ per bbl. of fluid produced will keep well equipment clean. Over-all costs are dependent on quantity of chemical needed and conditions encountered.

Mid-States Chemical Co. has introduced a granulated chemical compound called Pay-Day Oil Well Cleaner. The well is first filled with a specified amount of water, after which a predetermined amount of Pay-Day is dropped down the annulus. On contact with the water, a spokesman says,

the chemical creates an intense heat condition that is said to dissolve severe cases of paraffin accumulation, scale, " and other refuse."

•

Drilling Highlights

New Mexico—Intex Oil Co. et al No. 1 USL-Alto section 5-26n-1e, Rio Arriba County, pumped 75 bbl. of oil in 3 hours and then began to flow. The discovery, 10 mi. west of San Juan gas field, produces from the Niobrara sand, topped at 1,929 ft. The pay is believed equivalent to the Gallup sand, which is productive at Bisti field.

Montana—Kullberg & Otthouse Drilling and Montalban Oils No. 3-S-1 Tribal, section 36-36n-7w, Glacier County, was completed for 260 b/d of 52-gravity oil on open flow through perforations at 3,615-18 ft. in the Madison. The well flowed 47.7 b/d of oil through ⅜-in. choke and 70 b/d through ½-in. choke. The discovery is 4 mi. west of the north end of Cut Bank field.

Illinois — Development Associates, Inc., has followed up completion of No. 1 William H. Tracy, section 27-13n-7e, Coles County, with three additional wells, ranging in production from 18 b/d to 164 b/d. The discovery, completed for 140 b/d of oil through perforations in the Rosiclare (Mississippian), topped at 1,894 ft., is 2½ mi. north of Mattoon pool.

West Central Texas—J. R. McClean No. 1 Alex Menzies, section 60, John Hughes survey, Menard County, flowed 122 b/d of 36-gravity oil through 16/64-in. choke and perforations at 3,198-204 ft. in the Strawn (Pennsylvanian). The discovery, 14 mi. northwest of Menard, is in a sparsely-drilled area, with no nearby production.

British Columbia—Western Natural Gas Co. et al No. 5-X Clarke Lake, Permit 195, 10 mi. east of Ft. Nelson, was completed for 70-million cf/d of gas on open flow from a 314-ft. section in the Middle Devonian. The well is 1½ mi. north of the Clarke Lake field discovery.

West Texas—Sun Oil Co. No. 1 E. E. Wallace, section 33, block 5, H&GN survey, Kent County, was completed for 169 b/d of 33.8-gravity oil through 24/64-in. choke and perforations at 7,027-34 ft. in the Pennsylvanian. The pool opener is 2 mi. northeast of Polar field.

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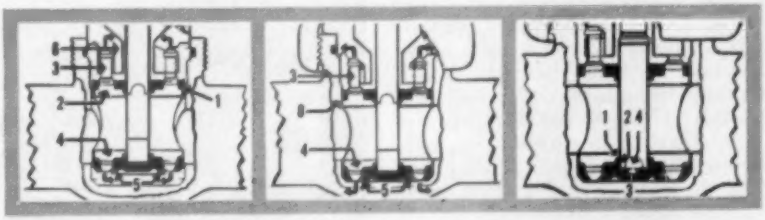

A. Resilient seat assembly (1) is reinforced with steel wear rings (2), having integral projecting pins at top (3) and bottom (4). In normal contracted position, the seat assembly is easily inserted in, removed from the body. Until the seat assembly is bottomed, the steel spread ring (5) does not act upon the lower projecting pins, nor do the bonnet legs (6) act upon the upper pins.

B. With the bonnet down and the seat assembly bottomed, the spread ring (5) has forced the lower projecting pins (4) outward. Similarly, the upper pins (3) have been wedged outward by the descending bonnet legs, providing a tight seal between body wall (8) and seat, preventing entrance of abrasives between seat and body wall.

C. As gate is closed, leading edge of gate slides past wear ring (1), contacts rubber ring (2) for positive rubber-to-metal seal. Seal occurs before gate touches rubber cushion (3), eliminating need for "bumping." Relief in bottom of gate (4) allows straddling of solid particles that might interfere with proper closure.

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Gas Export Hearings Hit Price Snag

- **Ontario utility wants same price from Trans-Canada that it will charge Midwestern Gas Transmission.**
- **Price hassle might delay decisions on all export plans for six to ten weeks.**

Hearings by Canada's National Energy Board on the current plans to export gas to the U.S. are bogging down under attempts by an Ontario utility to force down—or at least hold at present levels—the prices it pays for gas.

Before opening its hearings on Jan. 5, NEB had said that it would reach a decision within six weeks. The fact that a decision would be handed down in time for a spring construction start was taken as a sign of prior approval (PW—Dec.18'59,p50).

The proposals involve total exports of 858-million cf/d. Authorization is still expected, but not until after certain price and supply issues are solved.

Companies seeking export permits are Trans-Canada Pipe Lines, Ltd., for 204-million cf/d; and Alberta & Southern Gas Co. and West Coast Transmission Co., for a total of 654-million cf/d.

Trans-Canada would supply the gas to Midwestern Gas Transmission Co. over a 20-year period at Emerson, Manitoba. MGT has been authorized by the U.S. Federal Power Commission to spend $52-million for a pipeline from there to Marshfield, Wis., to carry the gas to Upper Midwest markets (PW—Nov.20'59,p41).

A 1,353-mi. pipeline would be built from west-central Alberta to San Francisco to carry the 654-million cf/d to West Coast markets.

Besides the exporters, six other companies are involved in this $332-million project (PW—Dec.18'59, p48).

Northern Ontario Natural Gas Co. claims that the proposed exports of Trans-Canada, its main supplier, would endanger its competitive position by driving up domestic gas prices. The Ontario utility, a major industrial supplier in that province, fears that large-scale exports would boost wellhead prices by intensifying competitive bidding for guaranteed supplies.

Northern Ontario isn't opposed to the West Coast proposal, but authorization of this project is also expected to be delayed by the price issue. Reason is that NEB has said it won't render decisions piecemeal.

Ironically, Northern Ontario says it favors the western export plan because it would spur further gas exploration in the western provinces. The utility also doesn't think that these exports would effect the prices it will have to pay for gas.

The Alberta-to-U.S. West Coast line has met some opposition in Western Canada, however.

The city of Calgary says that the plan doesn't adequately protect its gas needs (PW—Jan.22'60,p59).

The British Columbia Chamber of Mines charges that approval of exports of 458,750,000 cf/d by Alberta & Southern, all of which would come from Alberta, might rob British Columbia of its biggest potential gas market—the U.S. West Coast (PW—Jan.15'60,p31).

But it's expected that this opposition will neither block authorization, nor delay it appreciably.

Alberta utilities were able to wrest certain price and supply safeguards from the proposed exporters two years ago. At the time, they were guaranteed a weighed average price for additional gas any time they needed it.

Northern Ontario wants the prices it's paying for gas cut to those offered to Midwestern.

For the first three years of its contract with Trans-Canada, MGT would pay 30.83¢ per Mcf., at a 75% load factor. During the next two

Coal Mine Being Used for Gas Storage

The pipe these workmen are installing is part of Public Service Co. of Colorado's $5.6-million project to store natural gas in an abandoned coal mine 5 mi. outside Denver. When the mine is fully developed and filled with gas, the city will be able to draw on it for 210-million cf/d.

The mine consists of an old and a new section. The old working now contains gas, and injections into the new section have started. The project was launched last March, when PSC was warned that gas might be in short supply in Denver this winter. It hasn't been but, meanwhile, the number of the city's gas customers have grown.

years, it would pay 28.71¢ per Mcf. at a 90% load factor.

An escalator clause in its contract provides for increases every five years to a peak of 33¢ per Mcf. in the final year.

Northern Ontario has asked NEB for an outright denial of Trans-Canada's proposal, unless it gets price reductions.

Northern Ontario claims that Trans-Canada already has raised its asking price for gas by 13.5% over rates the utility is now paying.

The utility is a major distributor along 1,100 mi. of Trans-Canada's pipeline from Kenora, Ont., near Manitoba, to Orillia, Ont., 80 mi. north of Toronto. Its market is divided into three zones: western, northern, and central.

The most important zones are the western, which is the biggest, and the northern. In the former, Northern Ontario now is paying 33.6¢ per Mcf., and in the latter, it's paying 42.5¢ per Mcf. Both rates are based on a 90% load factor.

In November, for the first time in its operation, Northern Ontario topped prior average deliveries of 100-million cf/d. Among its growing list of customers are 11 pulp and paper mills, and the Sudbury (Ont.) operation of International Nickel Co.

The utility now is in the market for additional undisclosed volumes of gas for future needs. It wants NEB assurances of a guaranteed price and supply.

Trans-Canada says that its new rates to Northern Ontario for additional gas would be only 3% to 5% higher than existing prices, depending on how far the gas would have to be shipped.

The transmission company argues that Midwestern must get a lower price because it will have to pay for transporting the gas 512 mi. to its customers.

Moreover, Trans-Canada says, Northern Ontario has been very indefinite about its future needs, and the timing and takeoff points of future deliveries.

All the utility will commit itself to are "minor" purchases this year and next, with a gradual buildup over a 20-year period, Trans-Canada says.

NEB isn't expected to set any rigid price formula at this time. But it is expected to keep close watch on transmission company earnings once exports start.

If NEB feels that earnings are unreasonably high, it has the power to force a reduction of transmission charges to both domestic and U. S. companies.

Each year, transmission companies must post with NEB charges proposed for the following year.

After the first impact of U.S. exports, Canadian gas prices should level off, industry observers feel.

Main reason: Canada's vast established gas reserves should exceed demand for years to come. Proven reserves now are estimated at 30-trillion cu. ft.

Gas reserves of 2.1-trillion cu. ft. discovered from Dec. 31, 1958, to Sept. 30, 1959, alone are enough to supply Midwestern for the life of its contract.

Another factor that should counteract initial wellhead price rises is the greater operating efficiencies that normally result from higher pipeline volumes.

The one variable in the price picture is the effect that other fuels will have on the gas market.

But a green light on the export projects would bring advantages that would balance even permanent price rises, it's pointed out.

Chief advantages cited by officials would be the building boom in Western Canada and the improvement in Canada's cash exports to the U.S.

The price wrangle could delay decisions until the end of April—ten weeks beyond the date originally set by NEB.

Actually, had the hearings run strictly on schedule, they would have concluded last week.

At worst, they weren't supposed to run any later than late February, with decisions rendered by early March.

Intrastate Gas Line Expanded

Oklahoma Development Resources Co. plans a $12-million expansion of its natural gas gathering and transmission system to tap new reserves in Oklahoma's McAlester and Anadarko basins.

The new facilities will be entirely intrastate. Construction will start by Mar. 1, with deliveries slated to begin by Nov. 1, 1960, according to E. C. Joullian, president.

Sole purpose of the 300 mi. of new pipelines will be to supply gas to the four electric power generation plants of Oklahoma Gas & Electric Co.

Oklahoma Development's system now consists of two unconnected lines serving the utility's plants near Oklahoma City and Sulphur (map).

New construction will consist of a 12-in. trunkline linking the power company's plant east of Oklahoma City and its station in Muskogee. The line will run through the McAlester Basin for part of its route, and a lateral will dip down into the basin's rich Greasy Creek gas district.

At its western terminus, the trunkline will branch north and south of Oklahoma City to connect with Oklahoma Development's existing line west of the city. The southern end of this line will be connected to the other existing line, and from its northern end, two forks will extend deep into the Anadarko Basin.

The new lines thus will tie Oklahoma Gas & Electric's four plants to new supplies in both basins.

Deliveries through the new system reportedly will total 36-billion to 40-billion cu. ft. a year, under a 20-year contract.

The contract also reportedly provides for cancellation by the utility at any time for nondelivery at the current fixed price.

Oklahoma Development has been supplying gas to the plant west of Oklahoma City and the one at Sulphur for the past nine years. Deliveries have amounted to about 18-billion cu. ft. a year.

The plant in Muskogee and the one east of Oklahoma City currently are being supplied by Oklahoma Natural Gas Co.

Its contract expires Nov. 1, 1960, however, and is not expected to be renewed.

Oklahoma Development says it plans more laterals into the McAlester Basin in the future.

A spokesman says the company ultimately wants to be in a position to tap the entire basin.

It's reported that the company presently has no "firm" commitments for additional gas.

It expects to tie up "considerable shut-in production" in both basins soon, however.

THE THINGS YOU NEED TO KNOW

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What's New

IN PIPELINES

Tennessee Gas Transmission Co. is seeking authority to spend $48-million to loop part of its main line and boost compressor horsepower.

The expansion would increase the capacity of its system by 228.5-million cf/d. The new gas would go to 50 present customers, including its subsidiary, Midwestern Gas Transmission Co.

The project includes 155 mi. of 36-in. and 30-in. line parallel to TGT's line in Ohio, Pennsylvania, and New York, plus 72 mi. of gathering lines and the addition of 31,300 compressor horsepower.

To take its share of the additional gas, MGT would add 14,000 compressor horsepower.

•

Colorado Interstate Gas Co. has refunded $12,684,511 on gas rates dating from Feb. 5, 1958.

The refunds were made pursuant to a Federal Power Commission order issued Dec. 31.

The order approves an agreement worked out by CIG and its wholesale customers, which also provides for a 17% cut in future rates.

In another recent rate-slash action, FPC examiner Ewing G. Simpson ordered reduction of an increase sought by Union Oil & Gas Co. Union had asked a rate boost of $5.1-million for gas it sells to Texas Gas Transmission Co.; it will get $2.8-million. Average rate will now be 14¢ per Mcf., instead of the 18.9¢ per Mcf. asked.

In setting the rate, Simpson rejected evidence by Union of comparative prices on the ground that they were too "selected" to show "a definite and substantial trend."

•

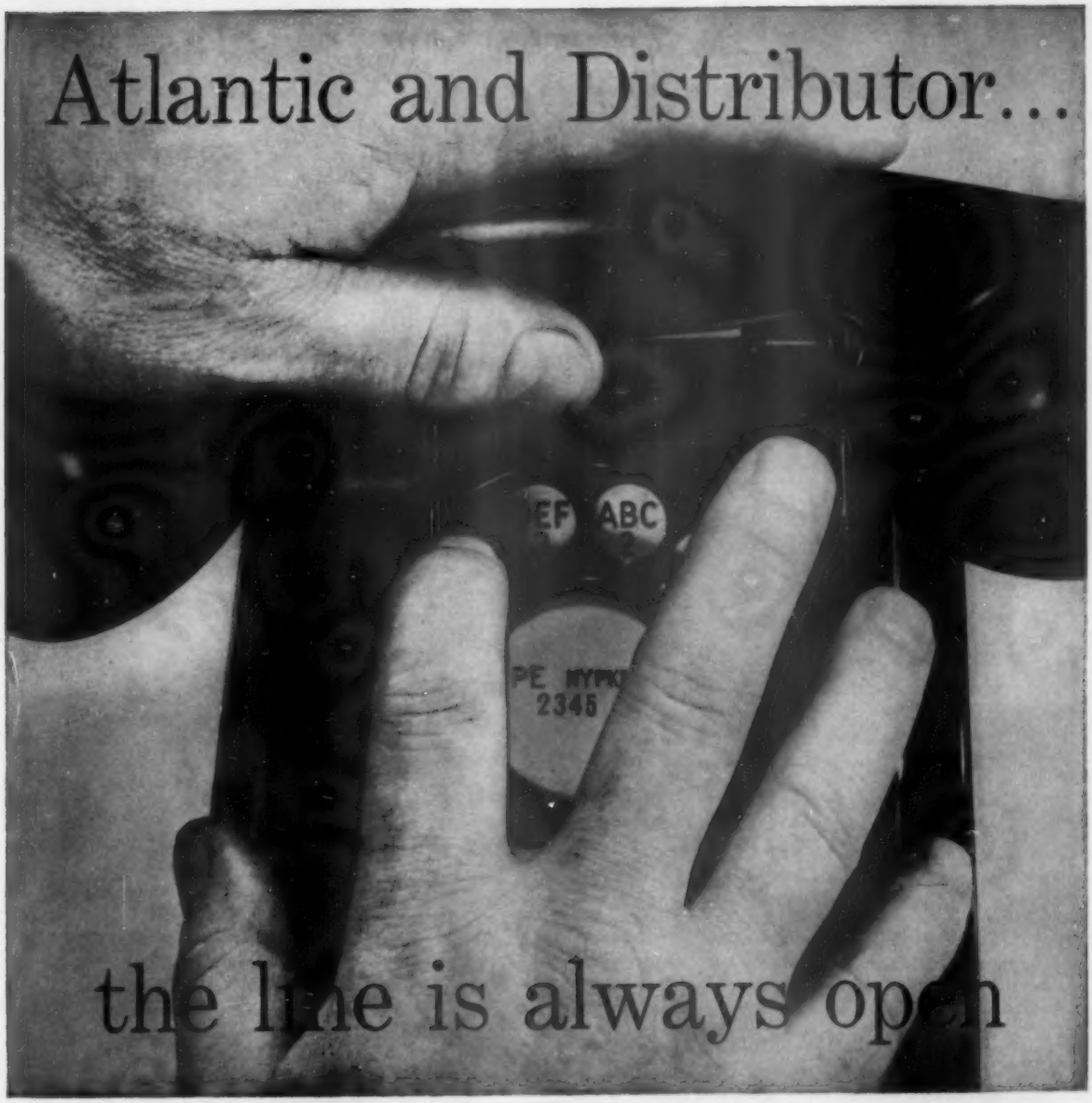
Arkansas Louisiana Gas Co. is branching out this year. Among the projects it has in the works are a gas meter manufacturing plant and a new gas transmission line.

The plant, to cost about $2-million, is being built at Russelville, Ark.

The 130-mi. line will be used to carry gas from the vicinity of Malvern to Helena, Ark. It will cost $9-million.

•

Crude deliveries by Interprovincial Pipe Line Co. last year rose 12% over 1958 to reach a total of 122.9-million bbl.



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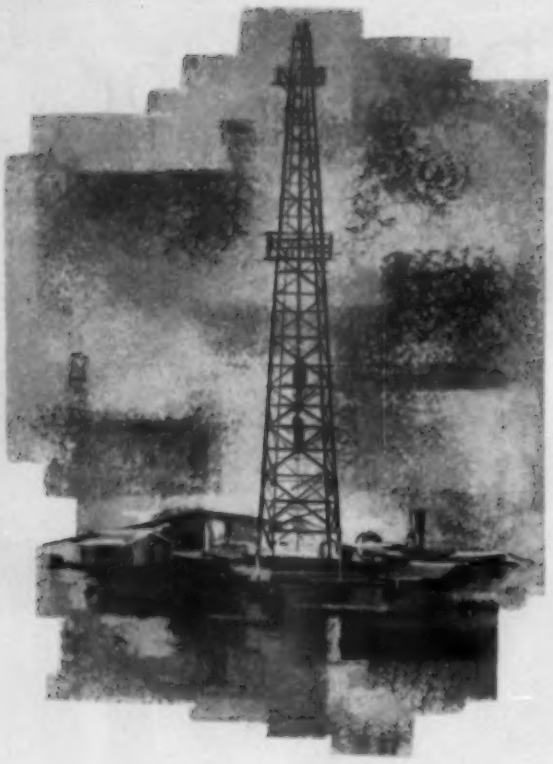

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New Persian Gulf Find Looks Better

The Persian Gulf's newest offshore field, near Das Island, looks much more promising following completion of a 5,000 b/d well that found pay in an entirely new formation.

The well is No. 3 Umm Shaif, located 2 mi. east of the 1958 discovery by Abu Dhabi Marine Areas, Ltd. The company is owned ⅔ by British Petroleum and ⅓ by Cie Francaise des Petroles.

Results of the No. 3 confirm the promise of the discovery and go a long way toward making up for last summer's disappointment over the No. 2, located 2 mi. west of No. 1 (PW—Jul.17'59,p35).

The new well found pay in the Araej (Jurassic) at about 9,500 ft. It was tested at the 5,000 b/d rate after acidizing in an undisclosed interval of this formation.

Besides being a good producer, it also indicates that the field may prove productive in three different formations, according to company officials.

Before reaching the Araej, the No. 3 Umm Shaif encountered the Thamama (Cretaceous) reservoir, which was productive in the two preceding wells, at about 6,000 ft. It contained water mixed with the oil, however.

The well also found pay in the Darb (Arab Zone), at about 8,500 ft., which tested at rates of 500-1,000 b/d.

These two formations are not considered commercial in the No. 3.

Company officials now estimate that the No. 1 discovery can produce 5,000 b/d from the Thamama at about 6,000 ft.

This is double the test rates announced in 1958 when the discovery was made in the initial wildcat drilled on the concession. (This is off the shore of the Trucial Coast, adjoining the smaller offshore Qatar concession on which Shell is about to resume wildcatting.)

The No. 2 Umm Shaif had temporarily dimmed hopes after it found the Thamama formation tight and capable of producing only 1,000 b/d.

India Sees Its Oil Market Doubling

BOMBAY—India's oil demand is expected to more than double in the next five years, racing far ahead of projected boosts in refining capacity.

Present oil demand is already about 120,000 b/d, according to government figures.

This is just about matched by the 116,000 b/d combined capacity of India's four present refineries (three on the coast, and one inland in Assam).

But the picture will change dramatically:

Oil demand is expected to reach 280,000 b/d by 1966, according to government forecasts based on present trends and the likely size of the Third Five Year Plan.

The government also expects that oil needs may again more than double by 1971, to as much as 500,000 b/d.

Refining capacity may increase 67% by 1966—to nearly 200,000 b/d—but even that will meet scarcely more than two-thirds of demand.

The only boost definitely projected so far will come from completion of the government's own two projected refineries, with combined capacity of some 50,000 to 55,000 b/d.

Another, newly proposed by Burmah-Shell, would add 26,000 b/d to the capacity of the company's 52,000 b/d plant near Bombay. The $24-million expansion proposal also includes construction of a 60,000-ton-yearly lube oil complex, as well as reorientation of the refinery to increase output of middle distillates.

The government hasn't yet approved this plan, but it did agree last summer to consider an expansion proposal. At that time, Burmah-Shell was given permission only to increase crude runs to the full 52,000 b/d capacity of its plant, after waiving duty protection on product output.

Since present crude reserves trail far behind demand, India now wants more foreign oil company aid in exploration. It wants another 200,000 b/d of crude production by 1966.

In its recent invitation to foreign oil companies to negotiate new exploration pacts under improved terms, it said that India's annual oil import bill, including crude, is already around $210-million.

Current production, from old fields in Assam, is less than 10,000 b/d. The new fields to be produced there by the joint government- and British-owned Oil India Private may yield "up to" 80,000 b/d, the government statement said.

Meanwhile, India's Oil & Natural Gas Commission proposes spending $400-million on its own exploration in the next five years, as against the $60-million allotted under the still-current five-year plan, according to the commission's secretary.

At present, he says, the commission is drilling with eight deep-drilling rigs supplied by the Rumanians and Russians. Three light portable rigs have now been ordered from the U.S.

3 Firms Boost Stakes in Sahara

PARIS—Esso, Shell, and Wintershall of Germany will increase their stakes in French Sahara exploration through entry of a second German firm in which all are part owners.

The company, Gewerkschaft Elwerath, is owned 11½% each by Esso and Shell, and 33.9% by Wintershall, which itself moved into the Sahara last December. Private German interests own the rest.

Last week Elwerath signed up for a joint venture with Eurafrep, an independent French oil company, as its first step into the French Sahara. It already has exploration interests in Libya, Ethiopia, Lebanon, Switzerland, and Peru (PW—Apr.17'59,p60).

Initially, Elwerath will have a 20% interest in the 1,740-sq. mi. Tan Emellel permit, circling the Edjele oil area and partly adjoining Esso acreage in Libya.

Eurafrep will be operator, retaining a 70% interest in this permit. The French government-controlled Petropar will hold the other 10%.

Later, Elwerath will also have a 42.5% interest in the 1,780-sq.mi. Hassi Ali permit requested by Eurafrep some 65 mi. west of El Golea.

Italy Eyes New Equipment Business

MILAN—Italy may soon become Europe's newest builder of mobile offshore drilling platforms, joining the ranks of Holland and Britain.

The company that plans to produce them in Italy: Nuovo Pignone, diversified manufacturing affiliate of Italy's state-owned ENI group.

"We're ready to start," Nuovo Pignone director Vittorio Scherillo told PETROLEUM WEEK in an interview. "All we're waiting for is the green light from the top." That means ENI's president, Enrico Mattei.

Negotiations are now under way with U.S. and European companies for licenses to build the platforms in Italy, Scherillo said.

Nuovo Pignone already has licensing, collaboration, and servicing agreements with U.S. firms—Ideco Inc. (one of the Dresser Industries), United Centrifugal Pumps, and Grove Valve & Regulator Co.

Besides drilling equipment—including complete Ideco rigs—the company makes refining and pipeline equipment, compressors, and heat exchangers.

R. G. LeTourneau, Inc., of Longview, Tex., has already indicated readiness to grant a license to the Italians for its mobile platforms, according to Scherillo.

LeTourneau officials approved Nuovo Pignone's facilities following inspection of its plant at Massa, on the north Tuscany coast, and at the nearby port of Marina di Carrara, where the platforms would be built.

LeTourneau built the one mobile platform the ENI group itself currently owns—a triangular "self-elevating" unit, operated with a tender. It is now being used in Sicily. ENI originally ordered it for its Iranian venture in the Persian Gulf, but diverted it and built a fixed platform there instead.

Venezuela Oil Flow Fails to Top 1957

Oil output in Venezuela recovered in 1959 to score a 6.4% gain over 1958—but it still failed to top its 1957 level.

The 1959 average was 2,771,000 b/d—8,300 b/d short of the record 1957 production, according to official figures just released by Venezuela's Ministry of Mines & Hydrocarbons.

In 1957, Venezuelan production jumped 12.8%, in the wake of the Suez crisis. In 1958, it dropped off by 6.3%.

The government forecasts a 4.5% increase in 1960 oil output but a drop, nevertheless, of 7.6% in its total revenues from oil.

The Ministry estimates the government's total 1960 oil revenues at 3-billion bolivars (based on a 4.5% increase in production), compared with an estimated 3,228,000,000 bolivars in 1959.

The Ministry's explanation for the drop is that collection was made in 1959 of supplementary payments for other years, and that wage and other cost increases are expected from industry-labor contract negotiations now under way.

The government also projects 4% annual production increases for 1961-65. This would bring its estimate of production from 2,887,500 b/d in 1960 to 3.5-million b/d in 1965.

Last year's output rose 166,200 b/d over 1958. Only Shell had a substantial boost in volume, though some newcomers to Venezuela showed dramatic percentage rises (table).

Over-all, seven companies registered some gain, while nine others cut back (counting only those in actual production).

Among the long-established producers, the three with increases, totaling 158,400 b/d, were Creole, Shell, and Texaco.

Seven that cut back a total of 76,500 b/d: Grande, Mobil, Richmond, Sinclair, Mercedes, Colon, and Talon.

Among the independent U.S. "newcomers" to Venezuela, four boosted output by a total of 96,800 b/d: Sun, San Jacinto, Phillips, and Signal. Two others that cut back, for a total drop of 12,200 b/d, were Atlantic and Superior.

These six companies, each with several partners, all moved into Venezuela in 1956-57.

How Companies Fared in 1959

Company	1959 (000 B/d)	Change from 1958 (000 B/d)	Change from 1958 %	Change from 1957 (000 B/d)
Creole	1,108.3	+ 37.2	+ 3.5	—40.1
Shell	797.7	+116.2	+ 17.1	—53.9
Mene Grande	370.6	— 18.3	— 4.7	—33.5
Mobil	114.6	— 13.0	— 10.2	— 1.1
Texaco	55.9	+ 5.0	+ 9.8	+10.7
Richmond	49.8	— 25.4	— 33.8	—42.2
Sinclair	46.5	— 15.0	— 24.4	+17.1
Sun	43.9	+ 31.8	+262.8	+43.8
San Jacinto	34.8	+ 26.1	+300.0	+34.8
Mercedes	31.9	— 2.2	— 6.5	+ 3.5
Phillips	29.1	+ 17.5	+150.8	+15.1
Atlantic	25.9	— 2.0	— 7.2	+ 1.0
Signal	24.7	+ 21.4	+648.5	+24.7
Colon	19.9	— 2.3	— 10.4	— 2.4
Superior	16.1	— 10.2	— 38.8	+15.4
Talon	1.3	— 0.3	— 18.8	— 0.9
Continental	0	— 0.1	—100.0	0
Coro	0	— 0.1	—100.0	— 0.2
Pan American	0	— 0.1	—100.0	0
Caracas	0	0	0.	— 0.1
TOTAL	**2,771.0**	**+166.2**	**+ 6.4**	**— 8.3**

What's New / AROUND THE WORLD

NEUTRAL ZONE—The Japanese-owned Arabian Oil Co. is gearing for a fast step-up in its offshore wildcatting, with three new tests slated from fixed platforms.

Last week it awarded a contract to De Long Corp. for three template-type drilling platforms, to be towed from England and installed in May and June. They're designed for drilling in 130 ft. of water and include a production deck and 48 x 70-ft. drilling deck.

They'll be used with a tender by Seacat Offshore Drilling Co., which recently was awarded a two-year drilling contract. International Drilling Co. is currently drilling the company's first wildcat.

•

AUSTRALIA—Shell will install a $38-million cat cracker at its Clyde refinery, near Sydney, under a three-year, $49-million expansion plan. The new unit will add 150-million imperial gallons annually to Shell's gasoline output, which, it says, will meet 25% of rising Australian demand. The plan also includes a 12-mi. pipeline to the refinery from Gore Bay.

•

SPAIN—Spain's imports of crude last year inched up to 134,000 b/d from 132,000 b/d in 1958, according to unofficial preliminary estimates. Products imports increased 20% to about 14,000 b/d.

•

USSR—An unofficial Chilean trade delegation left Moscow last week with what it called a "quite unusual" offer of Soviet oil and oil equipment in exchange for Chilean copper and nitrates.

Details were not disclosed, but the Russians were described as offering oil equipment on "very favorable" credit terms—though not as low as the 2% they've granted other countries on a government-to-government basis.

•

BULGARIA—Bulgaria's hopes for rapid development of oil haven't been fulfilled in the past two years. Output, which reached a peak of 5,700 b/d in 1957, dropped to around 4,000 b/d in 1959, according to a Soviet oil monthly—all from the country's sole field, discovered in 1951.

•

PERU—A Union Oil Co. of California affiliate has given up on two of its three concession areas. Petroleo Sullana, owned 40% by Union and 60% by the Wiese interests of Lima, gave up all of its acreage in the Sechura area near the coast, where it drilled seven dry holes, and also all acreage in the remote interior of eastern Peru, where it carried out geophysical work.

•

JAPAN—Standard-Vacuum's 55%-owned Japanese affiliate is the latest to plan entry into petrochemicals. Toa Nenryo Kyogo Co. has applied for approval to set up a new subsidiary at Kawasaki, Japan's fast-developing petrochemical center near Tokyo. It would go into operation next year, producing 10,000 tons each of polypropylene and octanol derivatives.

•

BRAZIL—California Standard last week confirmed that it is negotiating for the sale of its Brazilian asphalt plant to Petrobras, Brazil's government oil development monopoly. No details on the terms were disclosed.

•

USSR—Soviet oil and gas investment this year will be boosted 25% over 1959, with refinery and pipeline construction to get the biggest share, says Tass, government news agency. It also says secondary recovery alone is expected to account for an 800,000 b/d boost in crude production.

•

VENEZUELA—The Sun Oil group is increasing the pumping capacity of its Lake Maracaibo flow station by 20,000 b/d. Sun's 72,000 b/d production is temporarily reduced to 41,000 b/d.

•

TURKEY—M. W. Kellogg Co. has been awarded the main construction contract for the 20,800 b/d refinery planned by Caltex and the Turkish government firm Turkiye Petroleri A.O. Caltex and TPAO are now forming Istanbul Petrol Rafinerisi A.S. to own and operate the $25.7-million plant at Istanbul's deep-water port of Izmit.

•

Wildcats in the News

VENEZUELA—Pan American International has abandoned its first Gulf of Paria wildcat at 6,890 ft. It has suspended all operations on its offshore tract pending evaluation of the findings in No. 1 Gopa, which had difficulties with lost circulation from the start.

LIBYA—The Conorada group's latest test on the Block 32 structure, where it brought in Libya's third-biggest producer so far, has now been completed as an oil well flowing 70 bbl. per hour from 3,780 ft. It's the F-3, third success in three tries on the structure. The F-2 flowed 43-gravity oil at a test rate of 8,000 b/d.

ISRAEL—A 14,000-ft. wildcat will be spudded in March near the Sinai border in the remote Keren Djebel by Lapidoth-Oil Prospectors, Inc., the newly combined companies that established the Heletz field to the north. Chief geologist Walter Randall, of Denver, says the test will aim for the Cretaceous and Jurassic on a promising anticline 4 mi. long and 2 mi. wide.

INDIA—An oil strike last week at 4,925 ft. in the fourth wildcat in the Cambay area is considered a decisive indication of the basin's commercial prospects by India's Oil & Natural Gas Commission. The commission, which is receiving Rumanian technical assistance in its exploration venture, first found oil in the area at 5,000 ft. in its Lunej wildcat in 1958. Two more tests are now planned there.

GUATEMALA—Ohio Oil's sidetracked No. 1 Chinaja is running into difficulties again with high pressures and lost circulation. It's now down to 10,800 ft.—below the 10,005-36 ft. where the wildcat had originally encountered Guatemala's first promising oil show.

NIGERIA—Two of three wildcats drilled in December found oil, Shell-BP of Nigeria announced last week. This brings the 1959 total to nine wells capable of producing oil, out of the 37 wildcats drilled. The new successes were the 9,179-ft. No. 1 Ibibio, in Uyo province, and the 11,490-ft. No. 1 Alakiri, in Degema province. The dry hole was No. 1 Umuowa, carried to 6,803 ft. in Owerri.

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Automatic radiator shutters reduced the coolant temperature variation recorded in severe mountain road tests from a 79° range to a 20° range. Engine operation with coolant temperatures in the 167° to 187° range means less expansion and contraction, more efficient combustion and better lubrication . . . all of which contribute to longer engine life.

Dynamometer tests showed *no vapor lock* with Ford's submerged-type electric fuel pump at temperatures up to 200°. Incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under the same conditions. Shaker table tests plus constant exposure to oil, water and heat proved 1960 wiring harness to be *three times longer lived.*

Test results plus the experience of satisfied users are important, but that is not all. For 1960, the Super Duty line has been broadened to provide even more flexibility in power train options. See your Ford Dealer!

**Name available on request*

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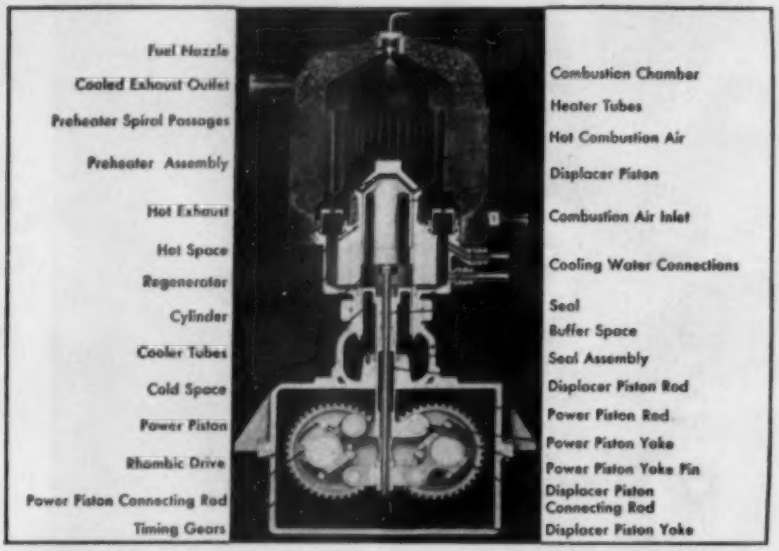


TWO FAMILIAR ENGINE PRINCIPLES are being adapted today to new uses. The old Sterling-type heat engine (left), is getting a face-lifting from General Motors, for use as an auxiliary powerplant. And the free-piston engine, gas-fired (right), is being adapted by Battelle Memorial Institute to drive an air-conditioner compressor. Box at right shows how it operates.

New Applications for Old Engines

Two new types of small, noiseless engines, of great simplicity, will soon be available commercially for auxiliary power production at high efficiency. One uses natural gas; the other can burn any liquid fuel.

Both of these engines were described and discussed at the annual meeting of the Society of Automotive Engineers in Detroit this week.

Both incorporate old, well-known concepts, in an entirely new design.

One is a combination of a free-piston, gas-injection, spark-ignition, two-stroke engine with a gas compressor. It is intended mostly for refrigeration and air-conditioning.

It was developed by Battelle Memorial Institute, under the sponsorship of the American Gas Assn. Its full development took four years.

The problem, Battelle engineers say, "was to combine the spark-ignition gas engine and the vapor-compression refrigeration cycle in such a way that the initial installation, maintenance costs, and the noise level, would not be deterrents to its general acceptance."

The unit built at Battelle has a refrigerating capacity of 3 tons per hour. It can operate 2,000 hours without any servicing, and is intended for a 10,000-hour replacement life, Battelle says. It operates at 1,500 cycles per minute, and the compression ratio in the combustion chamber is nominally 6 to 1.

Cylinder and cylinder head are air-cooled, and lubrication is provided by a small quantity of oil delivered directly to the cylinder wall.

Extensive laboratory experimentation was necessary to design fuel-injection and fuel-ignition systems that were simple and fool-proof.

Positive, automatic starting of the engine had to be worked out: it had to be a one-shot operation, with low power requirements. The electric ignition system, in particular, had to be designed from scratch. "Proximity-ignition" is being used, which means that the spark occurs when a ground electrode, situated on the piston head, is brought into proximity with an insulated electrode located in the cylinder head, and energized with a suitably high electric potential.

The rights to make and market the new gas engine and compressor for air-conditioning applications were acquired recently by Robertshaw-Fulton Controls Co.

The other engine is a modern version of the Stirling external-combustion heat engine.

It is being developed by General Motors Corp. in cooperation with Philips Gloeinlampenfabriken, of Eindhoven, the Netherlands, from which GM acquired the license for the U.S.

The engine, which is virtually noiseless, according to GM, is lightweight and portable. It is designed primarily for auxiliary power plant service. The test units have been operated on conventional gasoline and diesel fuel, GM says.

The Stirling heat engine, which antedates the automotive gasoline engine by over half a century, operates along a thermodynamic cycle which is highly efficient.

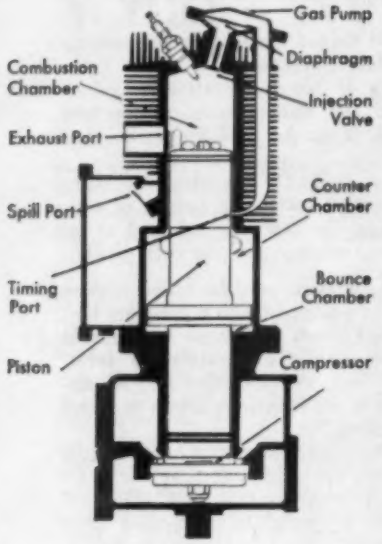
The engine consists of several cylinders, one of which is the power cylinder, and the others—there may be one or several of these—are air cylinders, each equipped with a heat regenerator.

This regenerator consists of a mass of fine wires sealed within eight individual cups located in a circle around the engine.

The prime mover is air, heated by an external oil or gas flame.

This air expands, and imparts its energy to the power piston, which, in turn, operates, the crankshaft. But instead of being exhausted to the atmosphere, like combustion gas, with a considerable loss of heat, the air is returned to the heating zone of the engine, and used over again.

The air imparts its latent heat to the regenerator at the beginning of each cycle, and recovers most of it towards the end of the cycle.



How the Free-Piston Gas Engine Operates

WHEN the piston is at bottom dead point, the gas pump contains a full charge of fuel beneath the diaphragm, and the counter-chamber is at atmospheric pressure. As the piston moves upward, counter-chamber pressure rises, while the combustion chamber remains at near-atmospheric pressure. Just before the exhaust ports close, counter-chamber pressure is transferred through a tube to the gas pump where it actuates the diaphragm. The gas injection pressure opens the spring-loaded injection valve, and the gas is injected into the combustion chamber.

Shortly after injection is completed, counter-chamber pressure is relieved by the spill ports. Air from the counter-chamber, which is discharged through the spill ports, is stored in the air receiver until the next scavenging cycle. When the piston reaches top dead point, both counter-chamber and air receiver are at scavenging pressure.

At this point, the spark plug ignites the air-and-gas mixture. As the piston moves down, counter-chamber pressure drops, due to the re-expansion of air in the counter-chamber and fuel expansion system.

After subatmospheric pressure is reached, the gas diaphragm retracts, drawing a new charge of gas through the valve. After the piston has completed about ¼ of its downward stroke, and for the remainder of the stroke, the counter-chamber is refilled through the intake valve.

When the piston reaches bottom dead point, the cycle repeats.

Plastics Users Need To Know More

An intensive effort is being made by manufacturers of plastics to provide much-needed information about their products to those who transform these raw plastics into finished products, as well as to the final users of plastic articles.

Plastics production hit a record 5.6-billion lb. in 1959, worth over $3-million. U.S. production will reach an estimated 6.4-billion lb. by 1960. Most of these plastics are of petrochemical origin.

All types of plastics showed substantial increases over previous years, the most spectacular being the polyethylenes and the vinyls. Both exceeded the billion-pound mark for the first time. Cellulosics, urea and melamine, polystyrene, phenolics and polyesters showed increases of from 12% to 28% over 1958.

Since 1868 when the first plastic, celluloid, was created in the U.S., the industry has progressed by leaps and bounds. Today there are:

- Over 200 companies manufacturing the basic raw materials for plastics;
- Over 2,000 processors; molders, extruders, film and sheeting makers, high-pressure laminators, reinforced plastics manufacturers, and coaters;
- Over 3,000 fabricators, of which approximately half work on rigid plastics and half make film and sheeting into finished products.

Even among fabricators and finishers of plastic products—those who receive the sheets, rods, and tubes, and convert them into finished articles—few are adequately informed about the characteristics of the products with which they work.

"The growth of this plastic business has been so fast that we are confused, and need all the assistance that the manufacturers and processors can give us," Henry Enrich, president of Henry A. Enrich & Co., maker of the "Model Home" line of cabinet accessories, told PETROLEUM WEEK.

"We need their advice to make the correct selection of new plastics for our merchandise, to learn what to do and what not to do when handling these plastics, and to inform our customers, who know even less about plastics than we do.

"New types of plastics are being developed incessantly. The articles that we made out of a certain type last year, we find we can make better now with another plastic. But we must be told how."

This attitude on the part of a manufacturer making finished products out of plastics in three large factories is typical of that of most "end products" makers. It poses a definite problem to the industry.

The intensive educational program appropriate for such a rapidly expanding industry is being supported by all leading manufacturers. Their efforts are being coordinated by the Society of the Plastics Industry, Inc.

Today SPI has 900 member companies in the U.S., and over 200 in 28 foreign countries outside of the Iron Curtain.

"Furniture makers, builders, and automotive engineers have known woods, metals, and glass for centuries," an SPI spokesman told PETROLEUM WEEK. "They know exactly what to expect from each of these materials when they are applied to a certain job.

"But when it comes to plastics, their experience is limited. Plastics are relatively new. New types and new applications for existing types are daily occurrences. That is why a concerted effort on the part of all plastics manufacturers is so necessary."

Among SPI's many tasks:

- It sponsors the adoption of voluntary commercial standards to establish uniform test methods, certification, and product identification. Fifteen sorts of plastics products so far have had such standards promulgated by the U.S. Dept. of Commerce. SPI is currently working on a dozen more.
- Its 22 divisions and 16 committees work on problems confronting the industry, particularly with reference to legislation, safety, and education.
- It has recently published a "Plastics Safety Handbook," in cooperation with the National Safety Council. The book covers such subjects as fire prevention, health and hygiene, good housekeeping, machinery, maintenance, materials handling, and inspection.
- It publishes informative bulletins and booklets for use by its members, and by the industry as a whole. One such booklet is "Plastics, the story of an industry."
- It maintains contact with universities and colleges that include courses in plastics in their curricula.
- It cooperates with manufacturers in the preparation of adequate labels. From 1956 to 1959, it conducted a yearly "label contest."
- It organizes National Plastics Exposition every 2½ years, and several specialized conferences and exhibitions each year.

Memo-Motion for Modern Maintenance

A novel data-gathering technique for simplifying and improving maintenance operations is making rapid progress in the petrochemical industry.

It was described this week at the 11th Plant Maintenance and Engineering Conference in Philadelphia, by Geo. H. Lewis, of the Industrial Engineering Dept. of Union Carbide Corp.

The technique, called memo-motion, is based on a motion picture study of existing working practice. It was developed as far back as 1945, by Dr. M. E. Mundel, of Purdue University. But it began to take hold in modern plants only recently.

Its popularity was delayed for years for many reasons. Among them:

- Its principle was not clearly understood: It was often confused with "micromotion." The difference between micromotion, which is a study of detailed motions, and memo-motion, which is a study of main movements, is what makes the latter so useful in maintenance work, says Lewis.
- It was erroneously considered a form of time-study device, which was not too popular.
- It was considered very expensive. Actually, the equipment needed for memo-motion applications costs from $1,500 to $2,500, and a special technician is required to run it.

It was only after Union Carbide Corp. had demonstrated its practicability, and had started to talk about it, that various industries became interested in the technique. UCC has applied it in several of its chemical plants, with most gratifying results, it says. It has also been used by E. I. Du Pont de Nemours, by many other manufacturers, including several chemical plants in the Houston area.

Memo-motion is a special form of motion picture study, in which pictures are taken at the rate of 50, 60, or 100 frames a minute, with an accurate time between frames. Regular 16-mm. film is run at 960 frames a minute.

Memo-motion has the following advantages, according to UCC:

- It provides a more accurate record than a visual study for analysis and future appraisal.
- It has a quantitative value: Since the camera runs at constant speed, it can be used for work measurement.
- It has the advantage over regular motion picture technique of condensing the time covered, and of reducing substantially the cost of film.

The camera used for memo-motion can be equipped with a program timer that starts and stops the camera automatically at preselected intervals. Thus, memo-motion can be applied to the technique known as "work sampling."

This automatic operation of memo-motion has been applied at the Texas City (Tex.) plant of UCC. One roll of film is enough to cover eight hours of work.

Work sampling is particularly useful for the analysis of nonrepetitive activities, such as maintenance work, for which no complete time study is readily available.

The underlying theory of work sampling is that the percentage of observations that show a man or a machine working, or idle, or in transit, is representative of the total time actually spent by the man or machine in those activities.

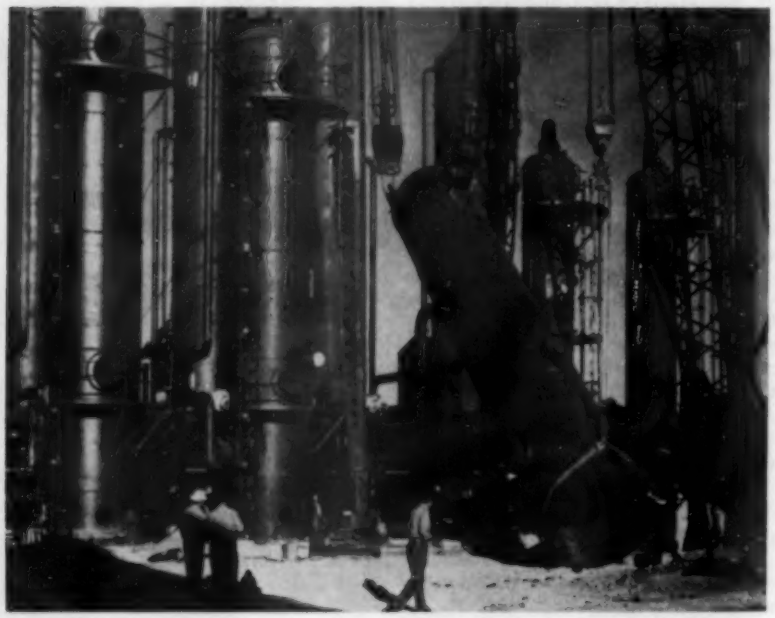
An essential condition of work sampling is that observations be taken at random—i.e., at fixed time intervals, regardless of what work is actually being done when the picture is snapped.

The applications of memo-motion studies are almost unlimited, said Lewis. In maintenance work, they are useful particularly in the following areas:

- Long-cycle operations, such as major overhauls and unit turnarounds;
- Irregular-cycle operations, such as routine upkeep;
- Crew activities (jobs requiring more than one man);
- Multimachine activities;
- Shop layout and materials handling;
- Recorded picture histories.

Memo-motion has been used successfully in the petrochemical industry, to record pictorially the operation of jobs under study. Management and unions can then be shown any proposed changes in the methods followed.

To use the technique effectively, says UCC, someone in the organization must be properly trained, and in a position to devote the necessary time to the technique and its interpretation.



New-Type Absorber Plant Built in Texas

These carbon dioxide absorber towers are part of the treatment plant just completed at Fort Stockton, Tex., by Brown & Root Inc., for Transwestern Pipeline Co. The plant will treat 180-million cu. ft. daily of natural gas—containing 28% of carbon dioxide and 0.2% of hydrogen sulfide—at a pressure of 1,050 psi. The Italian Giammarco-Vetrocoke process (PW—May29'59,p64) will be used to remove the acid gases—the first time this process has been used in the U.S. Pumps of more than 1,000 hp. each are used to circulate the chemical solutions employed.

What's New / IN PROCESSING AND PETROCHEMICALS

Work is expected to start next month on a $17-million gas processing plant and gathering system to serve Homeglen-Rimbey and Westerose South (Dick Lake) fields in central Alberta.

The Alberta Oil & Gas Conservation Board has conditionally approved the project, provided that provincial health authorities are satisfied there will be no air pollution in the area.

The plant will be designed to handle 326-million cf/d. The gas is under contract to Trans-Canada Pipelines and Alberta and Southern Gas Co.

British American Oil Co., Ltd., will operate the plant. Poole-Pritchard Canadian, Ltd., has the construction contract.

•

Oronite Chemical Co., subsidiary of Standard Oil Co. of California, will be producing paraxylene in France later this year.

Its partner in the venture will be a new French company—Societe Californie-Atlantique—now being formed by Antar Petroles de l'Atlantique, and Societe Progil.

The French company will build and operate a plant at Donges, on the Loire River, to produce paraxylene—a chemical widely used in the manufacture of synthetic fibers.

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An expansion program now under way at British American Oil Co.'s Calgary refinery will boost crude capacity from 7,500 b/d to 10,000 b/d.

Existing combination, crude topping, vacuum, and thermal cracking units are being revamped. A new control room will combine control instruments for the catalytic reformer, combination, and treating units.

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Dow Chemical Co. has announced another major expansion in polyethylene capacity. Engineering work has begun at the company's Texas division, at Freeport, to hike polyethylene production there by about 67%. Completion is set for 1961.

•

A 400 b/d Merox unit for treating thermally cracked gasoline is now on stream at Sunland Refining Co.'s Bakersfield (Calif.) plant. The process, developed by Universal Oil Products Co., is said to cut costs by eliminating expensive steam stripping and promoting longer catalyst life.

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The first shop-assembled carbon monoxide-fired boiler in the world is being built by Babcock & Wilcox Co. for Administracion Nacional de Combustibles, Alcohol y Portland, of Montevideo, Uruguay.

At normal capacity, and fired with oil exclusively, it will make 43,000 lb. of steam per hour at 600 psi. When carbon monoxide gas is burned, together with a small amount of oil, it will produce 30,000 lb. of steam.

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DEPT/Marketing

Marine Lubrication Market Expanding

The increasing importance of diesel vessels in the world's ocean-going fleets is putting greater and greater emphasis on marine lubrication.

According to one executive of Mobil International Oil Co., diesels now comprise approximately 40% of the world's merchant tonnage, compared to 3% in 1923.

Diesels, which use nonrecoverable cylinder lubricants, consume considerably more lubricant than turbine-driven vessels, which may lose only 10% of their supply each year.

Furthermore, the nearly completed trend toward greater use of cheaper, heavier fuels in diesel vessels has also placed greater stress on marine lubrication.

Shippers have turned to oil companies to develop marine lubes that will counter the corrosive effects of sulphuric and other acids that form during the combustion of high-sulfur residual fuels.

Mobil and other oil companies have responded with alkaline additives, which neutralize the corrosive ingredients in these fuels.

Even the turbine manufacturers, who are trying to force more power out of a given-size power plant, are becoming more demanding in their marine lubricant requirements.

An 8,200- to 10,000-hp. plant today occupies no more space than a 4,000-hp. plant did ten years ago, says Mobil. This increased efficiency puts greater pressure on gear surfaces.

"Basic mineral oil will not satisfy the lubrication requirement of high-output machines," says Chet W. Hoffman, lubrication advisor for Mobil International, "so we have had to develop additives to provide greater protection and lubrication."

All these factors have contributed to the 25% increase in marine lubrication demand over the past five years. Today the market exceeds 2-million bbl. per year.

Anticipation of expended growth in nuclear shipping is sending oil companies back to their laboratories to develop a radiation-resistant lubricant.

Thus far, oil companies have satisfied the lubrication requirements of nuclear vessels with existing lubes that are sufficiently resistant to radiation. For example, the nuclear submarines Nautilus and Skate (both of which were initially lubricated by Mobil) and the merchant vessel Savannah (which will be lubricated by Texaco Inc.) have not required specially developed lubes.

Many oil executives anticipate that, by 1980, nuclear vessels will comprise 25% of total world merchant shipping.

With this expanded use of nuclear powerplants will come the desire to build more compact engines. At present, the steam and pressure conditions that exist in nuclear vessels date back to pre-World War II designs.

But with greater compactness, will come greater radioactive contamination of marine lubricants, oil men feel. At present, marine lubricants in nuclear vessels are well shielded from the nuclear power source.

Oil researchers are now developing lubricants that will overcome the effect of greater radiation, which enlarges the molecules of lubricants and causes their viscosity to increase.

Delivery of lubricants is another important way in which oil companies will compete for the expanding marine market.

Aside from reciprocity in choosing suppliers, shipowners are influenced by the breadth and completeness of the service they can expect. They tend to favor oil companies that can provide them with lubricants quickly and correctly wherever their ships may sail.

Socony Mobil says a major reason that it has won more than one-third of the world's merchant marine market is that it provides lubrication stations in over 425 ports in 75 countries.

One of the features of Mobil's appeal is the M/V Mobil Service and its eight sister lube delivery tankers stationed around the world.

The spunky, 4½-knot Mobil Service can lug 42,000 gal. of several grades of lubes around New York harbor, and save several hours in supplying an ocean liner. It's the only lube tanker in New York harbor.

Other lubricant suppliers in the harbor envy the tanker's maneuverability but claim they would not have enough lube business to keep a similar ship busy.

Three Divorcement Bills Proposed

Rep. James Roosevelt (D., Calif.) introduced not one, but three bills this week, all aimed at reducing the influence of integrated oil companies in retail marketing.

The oil industry had been expecting Roosevelt-sponsored legislation concerning the divorcement of tires, batteries, and accessories from oil company control. But the chairman of the House small business subcommittee surprised oil men when he also introduced legislation dealing with the ownership and leasing of retail outlets.

One bill would, in effect, forbid integrated companies to maintain company-operated service stations.

Although the wording of the legislation calls for the elimination of retail marketing by all companies that also market at wholesale, the bill does not prevent an oil company from owning retail properties.

However, the oil companies would have to lease these retail properties to a third party before Jan. 1, 1964.

The bill would also prohibit any payment to oil companies for sponsoring the sale of motor vehicle parts, equipment, and supplies, as well as tires, batteries, and accessories.

Such a bill would hit such companies as Standard Oil Co. (Ohio) and Standard Oil Co. of California, which maintain a large percentage of company-operated stations.

This bill is similar to legislation that Roosevelt introduced in 1957. But the old bill went further in divorcing retail properties from integrated companies, denying them the right to hold retail outlets even if they leased them.

Roosevelt, however, does not expect to be very successful with this bill, so he has introduced alternative measures.

"Frankly," he said last week, "chances of passage [of this bill] in the immediate future are relatively small." For this reason, he gave Congress a choice of two other bills that may be more acceptable.

One alternative features the divorcement of tires, batteries, and accessories from integrated oil company control.

Actually, the bill would prohibit suppliers from receiving any form of

remuneration from anyone for sponsoring TBA sales.

This bill grew out of the hearings that Roosevelt held last month (PW—Dec.18'59,p62). The Congressman says he will permit the oil companies to have "a day in court" next month to answer charges made by retailers.

This "day in court," however, will probably have little effect on Roosevelt's plans to push TBA divorcement. He seems convinced that "practices of intimidation and coercion" must be stopped through legislation.

Roosevelt's third bill would require oil companies to file service station leases with the Federal Trade Commission.

Such a bill would enable FTC to bring public pressure to bear against any provisions that were deemed unfair.

The bill would not give the commission any enforcement power, however.

Roosevelt admitted last week that some members of his small business subcommittee had reservations about his bills. But the majority supports them, he said.

The bills will probably land in the House Judiciary Committee, headed by Rep. Emanuel Celler (D., N. Y.), where Roosevelt expects them to be favorably received.

Roosevelt also indicated that he will sponsor a new bill requiring all companies to notify the government of impending mergers.

Although this bill would be aimed primarily at food companies, it would affect all industries in some way, said Roosevelt.

The West Coast consent decree, involving six major oil companies (PW—Jun.26'59,p14), also came in for some criticism by the California legislator.

It's "full of holes," said Roosevelt, and the fact that Texaco Inc. did not join in signing the decree will mean that nothing can be accomplished until the Texaco issue is solved.

Roosevelt said he has heard that the Justice Dept. intends to proceed with court action against Texaco.

Oil Heat Unity Delayed to 1961

"It now looks as though it will be nearer the first of next year than the middle of this year" before a united oil-heat organization (PW—Nov.20 '59,p45) is formed, said L. S. Marshman, manager of wholesale planning for Mobil Oil Co.

It had been hoped, Marshman said, that the committee could start moving this month on the "Herculean task of clearing away a multitude of initial details," such as drafting a constitution and bylaws, preparing a budget, and recommending necessary staff personnel.

But "Holidays and business pressures made it necessary to slow down a bit," Marshman told the Independent Oil Men's Assn. of New England, in Boston, last week.

This delay "must not be interpreted as a change of heart by any of us who have been intimately involved with this project," Marshman warned.

However, the various rumors of disunity among prospective members of the new organization (PW—Dec.11 '59,p60) could not be brushed aside, Marshman admitted.

Many of the apprehensions and disagreements that seem to deter the creation of the organization may be resolved:

• **Voting apportionment.** "There definitely are some Oil Heat Institute members who are concerned that the new organization will be dominated by the major companies," said Marshman. "On the other hand, some of the major companies are worried that they will be out-numbered and outvoted by the fuel oil distributors and equipment manufacturers, even though the major companies will be putting up the largest share of the money."

But the necessary checks and controls to prevent these things from happening were recognized by the subcommittee that made its report before the API last November, Marshman noted.

• **Petty differences.** Marshman said he is confident that the individuals involved will recognize that "what is good for the most, not a few, must be the order of the day."

• **Regional disagreements.** Marshman drew attention to a letter written by R. G. Elmslie, managing director of the Washington State OHI to Fred Heaney, president of OHI of America.

Elmslie "pointed out several things about the new proposition which would not be good for them," Marshman said, "because things are different in the Northwest.

"Well, if things are truly different out there, it would seem they could be handled by arranging for regional flexibility in the implementation of our program," he concluded.

What's New
IN MARKETING

Ten oil companies attended a day-long discussion of a universal credit card last week, according to M. S. Week, executive vice-president of Oil Service Credit Corp., sponsor of the discussion.

Weeks told PETROLEUM WEEK that several companies are interested in a new alternative plan that was presented by Oil Services last week.

This alternative plan differs from the original plan, at which many companies balked, by permitting oil companies to do their own billing, collecting, and credit card issuance.

Oil Services would perform credit investigations, furnish all station promotional material, and also handle general advertising and promotion. Much of this activity is unnecessarily duplicated by each oil company, says Weeks.

Cost for this service would be 0.45% of the dollar billings through universal credit cards. Any other functions performed by Oil Services would be done at cost.

•

The Teamsters Union and the Gasoline Retailers Assn. of Lake County, Ind., have appealed for nullification of their convictions and fines (totaling $13,000) on price-fixing charges.

The union and the association were convicted earlier this month of preventing dealers from posting price signs and giving away premiums.

Since the conviction, trading stamps have begun to appear in Lake County, along with price signs, but there has been no rampant price cutting.

One dealer, who was a government witness at the trial, told PETROLEUM WEEK, "As far as I'm concerned, the association is dead."

Michael Sowachka, secretary-treasurer of Teamster Local 142, filed a motion to set aside his conviction. Sowachka, who was named by trial Judge Swygert as "the dominating force in the conspiracy," was fined $3,000 and received a six-month suspended jail sentence.

•

Skelly Oil Co. will shift its Kansas City (Mo.) marketing headquarters to Tulsa, Okla., and set up two regional offices in Kansas City and St. Paul, Minn.

The movement, which will begin later this year and end in mid-1961, will transfer most of the 600 employes in the Kansas City office to the company's new building in Tulsa.

DEPT/Personals

WILLIAM M. COCKE has been elected vice-president and general manager of Cit-Con Oil Corp., New York. Cocke, with Cit-Con since 1947, has been assistant general manager since 1950. He has also been associated with Marland Oil Co. and Continental Oil Co. Cit-Con, which is owned 65% by Cities Service Co. and 35% by Continental Oil Co., owns and operates a lubricating oil plant at Lake Charles, La.

W. M. Cocke

B. K. Smith

BYRON K. SMITH has been named to the newly created position of assistant to the president of Southern Pacific Pipe Lines, Inc., with headquarters in San Francisco. He was formerly assistant general manager of the 1,400-mile petroleum products line at its operational headquarters in Los Angeles. **William T. Eskew, Jr.**, formerly chief engineer, succeeds Smith in Los Angeles. **Robert R. McDaniel** moves up from northern district field superintendent, in Roseville, Calif., to chief engineer in Los Angeles, succeeding Eskew. **Charles B. Miller** succeeds McDaniel as superintendent at Roseville. Miller has been assistant to the general manager at Los Angeles. **Maurice A. Huso**, formerly electrical engineer at Los Angeles, is now assistant to the general manager, and **John M. Goss**, formerly engineer at Los Angeles, is now electrical engineer there. **Murray A. Levy** was promoted, without change in duties, from superintendent of products movement to manager of products movement, at Los Angeles.

BAGHER MOSTOFI and **MANOUCHEHR FARMANFARMAIAN** are new directors of National Iranian Oil Co., Tehran. Mostofi has been managing director of Iran Oil Co., exploration subsidiary of NIOC, since 1954, and a board member of that company since 1949. In 1959, Farmanfarmaian was appointed chairman of Iran-Canadian Oil Co., jointly formed by NIOC and Sapphire Petroleums, Ltd., of Canada.

M. A. NEWMAN, general sales manager for Ohio Oil Co., Findlay, Ohio, is in charge of three new sales departments, which formerly made up the general sales division. **E. J. McGarvey** has been appointed manager of the branded sales department, which is composed of the company's five marketing districts. The department is responsible for Marathon direct and jobber sales. McGarvey was formerly an assistant sales manager. **William T. Kirkbride**, formerly an assistant sales manager, has been named manager of the refinery sales department. It will be responsible for sales to refiners, brokers, and other wholesale accounts. **R. J. Powell** has been named assistant manager of this department. He has been assistant manager of the refinery sales department since 1956. **A. D. Lodge**, formerly supervisor of the technical services department, is manager of the commercial and special products sales department. This department is responsible for sales to national consumer accounts, sales of special products, and technical service functions. **I. W. Lloyd** is assistant manager of that department. He became sales manager of the former asphalt department in 1947.

JOE MEFFORD becomes division production superintendent for the Midland (Tex.) division of Sinclair Oil & Gas Co. He succeeds **O. G. Simpson**, who was named assistant division manager there. Mefford has been assistant division production superintendent at the Tulsa division.

J. Mefford

R. M. Mays

ROY M. MAYS moves up to director of reserves and production acquisitions for Continental Oil Co., with headquarters in Houston. He will direct the acquisition activities which were formerly the responsibility of **K. W. Brill**, who has transferred from New York to Denver as vice-president and assistant general manager of the Rocky Mountain region. Mays was most recently assistant general manager of Conoco's Southwestern region, in Ft. Worth. He joined Conoco in 1951 as Rocky Mountain region land superintendent. He was regional exploration manager there for two years before transferring to the Southwestern region in 1957.

BRYSON FILBERT is the new chemical products adviser to the refining coordination department of Standard Oil Co. (N. J.), in New York. He was formerly manager of manufacturing in Bogota, Colombia, for International Petroleum (Colombia), Ltd., an affiliated company.

ALBERT C. RUBEL, president of Union Oil Co. of California, Los Angeles, will receive the Anthony F. Lucas Gold Medal of the American Institute of Mining, Metallurgical & Petroleum Engineers, at its annual meeting Feb. 17. Rubel was selected "for his pioneering foresight in the application of engineering principles to petroleum development and production practices, and for his fostering the development of many production techniques valuable to the petroleum industry, and for his inspirational training and development of engineers not only to managerial, but also social and political responsibilities."

R. C. MARMADUKE has joined Austral Oil Co., Houston, as vice-president and exploration manager. He has been chief geologist for British-American Oil Producing Co., responsible for activities in South Louisiana, the Texas Gulf Coast, West Texas, New Mexico, Oklahoma, and the Rocky Mountain area.

R. C. Marmaduke

P. T. Ernst

PHILIP T. ERNST is the new manager of distributor sales for the New York sales region of Sun Oil Co. Ernst, who has been with Sun since 1929, was most recently manager of the Oceanside (N.Y.) sales district. **Ernest R. Johnson**, formerly district manager at South Amboy, N.J., succeeds Ernst at Oceanside. **E. Thomas Lillard** replaces Johnson at South Amboy. Lillard has been manager of the Newark district since 1955.

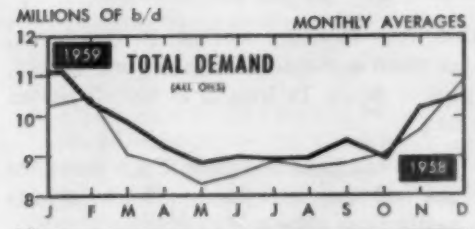
ROSS E. WILLIAMS has been appointed manager of Atlantic Refining Co.'s domestic crude oil valuation and budget division, in Dallas. He succeeds **W. F. Maxwell**, who is retiring after 42 years with Atlantic. Williams, who joined the company in 1935 in Philadelphia, was most recently assistant to the vice-president and general manager of domestic and foreign crude oil production, in Dallas.

HENRY J. CONRAD has joined Sinclair Oil & Gas Co.'s liquefied petroleum gas sales department as representative of its northeastern states sales office, at Camp Hill, Pa. He will handle LPG sales from Sinclair's Marcus Hook (Pa.) refinery, and tank car movement to that area. Conrad was a sales representative for a Philadelphia company before joining Sinclair.

E. J. GALLAGHER, formerly general manager of the production and pipeline department of British American Oil Co., Ltd., in Calgary, is the new president and director of Peace River Oil Pipe Line Co., Ltd., Calgary. Gallagher succeeds **E. D. Loughney**, who recently became president of B-A.

PETROLEUM WEEK'S

Fingertip Figures



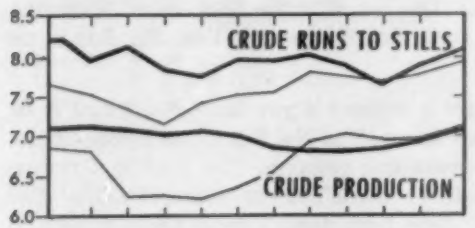
Figures for period ended January 23, except as noted

TOTAL DEMAND

Latest 4-week average	10.626
Year ago	11.195

DISTILLATE DEMAND

Latest 4-week average	3.208
Year ago	3.813

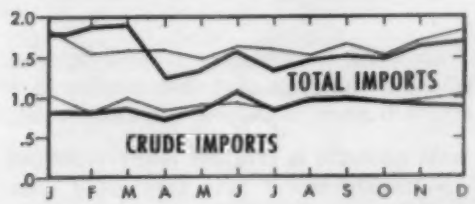


RUNS TO STILLS

Latest week	8.227
Previous week	8.302
Year ago	8.311

CRUDE PRODUCTION

Latest week	7.190
Previous year	7.146
Year ago	7.194

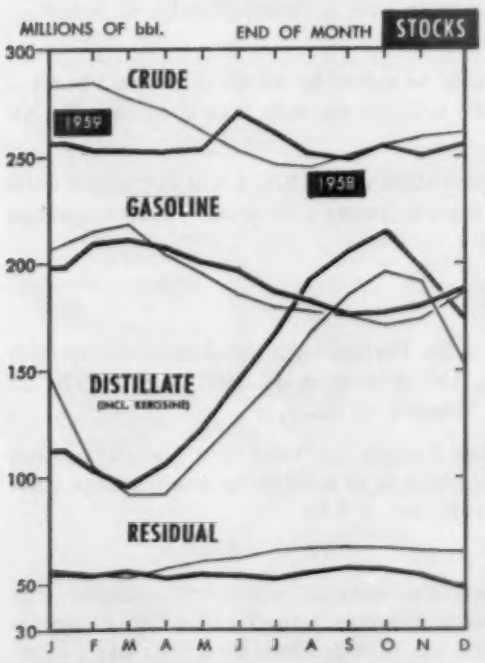


TOTAL IMPORTS

Latest week	1.810
Previous week	1.780
Year ago	1.567

CRUDE IMPORTS

Latest week	.844
Previous week	.960
Year ago	.729



CRUDE STOCKS

Week-ended 1-16	250.0
Previous week	248.9
Year ago	260.1

GASOLINE

Latest week	199.9
Previous week	196.5
Year ago	192.9

DISTILLATES

Latest week	168.5
Previous week	165.1
Year ago	121.8

RESIDUAL

Latest week	50.1
Previous week	51.3
Year ago	59.9

Further indications that overly optimistic forecasts are one cause of oversupply came this week during the Oklahoma Corporation Commission's hearing to determine the February allowable.

Representatives of most major purchasers requested that the February allowable be left generally unchanged from January's 540,000 b/d. Total nominations of 525,035 b/d were up only 1,630 b/d over January.

But Massena B. Murray, the state conservation director, recommended to the Commission that the February allowable be increased by 10%. In fact, he said that the allowable could be increased by as much as 25% without causing physical or economic waste. His reasoning?

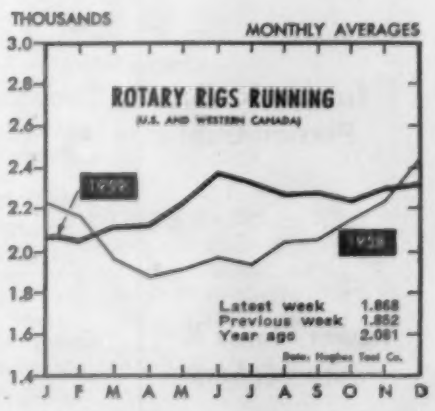
The Bureau of Mines forecasted that demand for Oklahoma crude in February will average 580,000 b/d, the same as in January.

Murray estimated that actual pipeline runs in the first 16 days of January averaged 559,057 b/d and that the average for the full month would be 545,000 b/d.

He then said the 10% increase in allowable would produce 545,000 b/d in February and would be "most desirable."

Representatives of several purchasers warned that their stocks were slightly higher than desirable and told the commission that an increase in the allowable might result in purchaser proration. They emphasized that spring turnarounds of refineries will be scheduled soon, reducing the take of crude.

And despite the forecasts, demand in the first weeks of January hasn't improved the general market position of heating oils—the industry's "money" product at this time of the year.



The Market Trend

Everybody Can Get It for You Wholesale

This year will be remembered as the time of the "special price." All sellers have them. Buyers get them if they scream loud enough.

There are "special" prices this week in every market. In Oklahoma, it's gasoline at 9.75¢—0.5¢ cheaper than kerosine. At New York harbor, it's "0.375¢ off" on delivered cargoes of No. 2. In Iran, it is 43¢ off posted on 8-million bbl. of crude for Japan.

No supplier has a price schedule he can hope to follow. Each customer gets a price that the supplier thinks will keep him happy. The trouble is that some people get happy less easily than others.

What's happening today is that suppliers on a broad scale are giving special discounts to big, wavering accounts, and are charging full prices to their most faithful customers. This week some suppliers in the East gave allowances to cargo customers. Some No. 2 accounts got a discount of 0.25¢ dating back to last fall. On No. 6, some back-dated discounts were handed out on purchases from Oct. 1 through Dec. 31. But some accounts still pay the full price.

The phoniness in posted prices is evident if you trace No. 2 fuel from the Texas Gulf Coast to New York barge. The No. 2 price of 8.625¢ at the Gulf barely covers the cost of crude and refining. The margin between Gulf and New York cargoes (0.875¢) doesn't cover transportation. The cargo-barge differential of 0.1¢ at New York doesn't cover throughput and handling.

Many other price sequences from crude to consumer suggest "special prices" all along the line. ("We're doing things in customer relations we wouldn't have dreamed of years ago.") Buyers, therefore, must stay alert.

And the intense pressure to hold accounts is creating many problems in business ethics. Many suppliers frankly admit that they have been forced by the competitive situation to give a "special" price to many of their customers, but not to all of them.

The special-price problem could be solved by an oil shortage. Then refiners could list an f.o.b. price and tell customers to take it or leave it. No shortage, however, is in sight.

A veteran trader sums the situation up: "Things will get worse until some small companies fold, or a big one passes a dividend." Meanwhile, the trick is to cut costs and increase volume.

Trouble in the Persian Gulf:

There are a lot of hurt feelings in the Persian Gulf these days. On the last rise in kerosine prices there, Caltex companies went only to 9.5¢ at Bahrain and Ras Tanura, an increase of 0.25¢.

This puts the other sellers at Ras Tanura (at 9.8¢) in a quandary. Also, all principal sellers at Abadan, which is at a shipping disadvantage compared to Ras Tanura and Bahrain, are at 9.6¢.

Power Plants & Idle Tankers:

Use of tankers for power stations in Norway and Sweden will probably come to an end soon. A very dry summer, which caused a shortage of hydroelectric power in these countries, has been followed by a very wet winter.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of January 25

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....12-13
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9.5-10
- Heating oil, No. 2....8.625-9.1
- Gas oil, 48-52 d.i....8.875-9
- Fuel oil, bunker "C"....$2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....11
- Gasoline, 87 oct research reg....10.125
- Gasoline, 79 oct research....9.375
- Gasoline, 70-72 oct motor method....9.25
- Kerosine....9.75
- Heating oil, No. 2....8.625
- Gas oil, 48-52, d.i....8.875
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....10-6-11.1
- Heating oil, No. 2....9.6-10.1
- Fuel oil, No. 6....$2.37-2.47

Okla.-Group 3, northern shpt., bulk
- **Gasoline, 91 oct reg....10-10.75↓**
- **Kerosine....10.375↓-10.5↓**
- Heating oil, No. 2....9.25-9.5
- Fuel oil, No. 6....$1.60-1.80

Chicago, bulk
- Gasoline, 91 oct reg....11-11.25
- Heating oil, No. 2....9.625-11.35
- Fuel oil, No. 6 high sulfur....7.5

Los Angeles, rack
- Gasoline, 88 oct reg....11.5-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.80
- Heavy fuel, PS 400....$2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....5
- Propane, Baton Rouge....5.625-5.875

Pennsylvania Lubes
- Bright stock, 25 p.t....23
- 200 vis. neutral, 25 p.t....27

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....25-26
- Neutral, solvent, 200-210 vis....21.5-22.5

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....25
- Neutral, solvent, 200 vis....21.5

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130....15.875
- Gasoline, 79 oct research....9.75
- Kerosine....10.625
- Gas oil, 48 d.i. minimum....9.875

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.62-2.97
- North Dakota, 36.0-36.9....2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.55
- California, Signal Hill, 21.0-21.9....2.32†
- North Louisiana-Arkansas, 36.0-36.9....2.77-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.435
- Virden (Man.)....2.31

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 47.0-47.9, Tucupido....$3.34
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, Las Piedras....1.75-1.88
- Tarra, 38.0-38.9, San Lorenzo....2.83
- Lagunillas Heavy, flat, Las Piedras....2.10

†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.90
- Safaniya, 27.0-27.9, Ras Tanura....1.50
- Iran, 34.0-34.9, Bandar Mashur....1.86
- Iran, 34.0-34.9, Abadan....1.81
- Iraq, 35.0-35.9, Fao....1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.67
- Qatar, 41.0-41.9, Umm Said....2.05
- Neutral Zone, Burgham, 23.5-24.4, Mina Saud....1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud...1.38

Middle East, Eastern Mediterranean
- Arabian, 34.0-34.9, Sidon....$2.27
- Iraqi, 36.0-36.9, Tripoli, Banias....2.31

Far East, Cargoes FOB Lutong, Sarawak
- Seria Light, flat....$2.57

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- **U.S. Gulf-New York, clean...(USMC—5%) $2.71↓**
- **U.S. Gulf-New York, dirty .(USMC—7½%) $2.64↓**
- **NWI-USNH, dirty .....(USMC—45%) $1.51↓**
- NWI-UK/Cont., dirty.....(Scale—32½%) 21/11*
- Persian Gulf-UK/Cont., dirty.....(Scale—45%) 32/11*
- Persian Gulf-USNH, dirty.....(USMC—60%) $5.08

**Sterling.*

ADVERTISERS IN THIS ISSUE

Atlantic Refining Co. 33
Avondale Marine Ways, Inc. ..... Cover 3
Bank of Montreal 7
Black, Sivalls & Bryson, Inc. Oilfield Equip. Div. 10
Dowell ..... Cover 2
Drilling Equip. Mfg. Co. 29
Ford Motor Co. 38-39
Halliburton Oil Well Cementing Co. 19
KLM Royal Dutch Airlines 43
Latex Construction Co. 32
Lone Star Steel Co. 8-9
Mission Mfg. Co. 20
Oil Center Tool Co. 4
Pittsburgh-Des Moines Steel Co. 17
Reed Roller Bit Co. 26-27
Republic Nat'l Bank of Dallas 16
Sheffield Div. Armco Steel Corp. 34
Sinclair Oil Corp. 1
Timken Roller Bearing Co. ..... Cover 4

Professional Service 51

Classified Advertising
F. J. Eberle, Business Mgr.

Employment Opportunities 51

PETROLEUM WEEK REPRESENTATIVES

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Boston 16 — David G. Sawyer, 350 Park Square Bldg., Hubbard 7-7160

Chicago 11 — Edward A. Callahan, Jr., H. Sherman Davis, 520 N. Michigan Avenue, Mohawk 4-5800

Cleveland 15 — J. E. MacArthur, 1164 Illuminating Bldg., 55 Public Square, Superior 1-7000

Denver 2 — J. W. Patten, Tower Bldg. 1700 Broadway, Alpine 5-2981

Houston 25 — D. O. Hanson, 724 Prudential Bldg., Jackson 6-1281

Los Angeles 17 — Peter S. Carberry, 1125 W. Sixth St., Huntley 2-5450

New York 36 — David G. Sawyer, 500 Fifth Ave., Oxford 5-5959

Philadelphia 3 — W. A. Potter, 6 Penn Center Plaza, Locust 8-4330

Pittsburgh 22 — J. E. MacArthur, Room 1111, Oliver Bldg., Express 1-1314

San Francisco 4 — William C. Woolston, 68 Post Street, Douglas 2-4600

Tulsa 3 — J. A. Hartley, 909 Enterprise Bldg., 522 South Boston, Gibson 7-5594

England, London E. C. 4 — E. E. Schirmer, McGraw-Hill Co., Ltd., 95 Farrington St.

DEPT/Service & Equipment Companies

RALPH HUGHES has been named vice-president, manufacturing, for the Security Engineering Division, Dallas, one of the Dresser Industries. Hughes, with Security for the past 14 years, was most recently manager of manufacturing for the division's Dallas and Whittier (Calif.) plants.

R. Hughes

E. W. Carne, Jr.

EDGAR W. CARNE, JR., has been promoted to manager of exports sales for the Baash-Ross Division of Joy Mfg. Co., with headquarters in Houston. Carne, who joined Baash-Ross in 1946, was most recently product manager for South and Central America.

WILLIAM E. FARRAGHER, JR., has been named advertising manager of Youngstown Sheet & Tube Co., at its general offices in Youngstown, Ohio. He has been assistant advertising manager since he joined the company in 1957.

WALTER L. TREADWELL is the new assistant general manager of Pacific Coast Engineering Co., Alameda, Calif. Treadwell, with Paceco since 1951, was most recently industrial engineering manager.

LOUIS ROTOR transfers to Maracaibo, Venezuela, as manager of stores for the Peticon Division of Franklin Supply Co. He was formerly store manager for Franklin at Liberal, Kan. **Jim Blane** transfers to Denver as Franklin's branch manager, and **John Russell** transfers there as city salesman. Blane was formerly city salesman in the New York office, and Russell has been located at the Tulsa office. Russell replaces **Maurice (Bud) Walters, Jr.**, who moves to New York as city salesman. At the same time, **Lee Croger** becomes manager of purchases and inside sales at Franklin's East Chicago (Ind.) store. He was most recently store manager at Harvey, La.

CLYDE V. BYERS is the new district manager in Anaco, Venezuela, for Nalco de Venezuela C.A., subsidiary of Nalco Chemical Co. He has been a district representative for the parent company's industrial division, in Houston.

DONALD FISHER and **SONNY McCURRY** have joined the sales engineering staff of Tyson Smith Co., Houston. Fisher has been associated with Maloney-Crawford Co. and with the Delta Tank Division of Mid-Continent Supply Co., and McCurry was formerly a sales and service engineer for Weatherford Oil Tool Co. Both men will be involved with sales and service of the company's oil and gas process equipment in the Houston area.

JIMMY WILKINS, Permian Service Co., Andrews, Tex., has been elected 1960 president of the Assn. of Oilwell Servicing Contractors. He succeeds **J. C. Williams**, Spring Hill, La. **Leo L. Kent**, El Dorado, Kan., was reelected first vice-president, and **Jimmy Hollis**, Lovington, N. M., was elected treasurer. Hollis succeeds **Barney Foster**, Odessa, Tex.

JAMES A. GROVES has joined Mission Mfg. Co. as sales representative for the Edmonton (Alta.) area. Before joining Mission, Groves had been associated with Oilwell Supply Co. for 11 years.

J. A. Groves

D. K. Goff

DAVID K. GOFF becomes a sales engineer at Cooper-Bessemer Corp.'s Houston branch office. He will work under the immediate supervision of **Earl P. Martin**, Houston branch manager, on the application and sale of Cooper-Bessemer compressors and engines in that area. Goff has been in the sales department at the company's headquarters in Mt. Vernon, Ohio, since 1957.

WILLARD CHIASSON has been named representative for the South Louisiana area for Gulf Coast Machine & Supply, of Beaumont, Tex. Gulfco recently opened a warehouse and sales office at Lafayette to serve this area.

RIGDON CURRIE, southwestern regional sales manager for Thompson-Ramo-Wooldridge Products Co., heads the company's new sales engineering office in Houston. He is responsible for sales activities in Texas, Oklahoma, Arkansas, Louisiana, and New Mexico. Before joining the Ramo-Wooldridge organization in 1956, Currie was a sales engineer for Spotswood Parker & Co., in Atlanta, Ga. He joined TRW Products at its founding in 1958.

EARL A. ERICH has been elected vice-president of Tube Turns Plastics, Inc., Louisville, Ky., an affiliate of Chemetron Corp. He joined the Tube Turns Plastics technical service staff in 1955 as a specialist in solving piping corrosion problems, and later was placed in charge of sales programs on the West Coast

and in the Southwest. He was promoted to assistant sales manager in 1956, and to sales manager the following year.

LLOYD HYMEL, CHARLES SHAKE, and **CHARLES C. WARREN** have new positions as division managers of Tuboscope Co. Hymel is now manager of the Harvey (La.) division, and Shake succeeds him as manager of the Houma (La.) division. Warren, a former Harvey division manager, is now manager of the Laurel (Miss.) division.

FRANK W. TAYLOR has been appointed sales agent for the tubular products division of Babcock & Wilcox Co., with headquarters in Denver. Taylor, who has had sales experience in the Denver area, will handle sales of the division's seamless and welded fittings and flanges on an exclusive basis in Colorado, Wyoming, and Montana.

D. E. Whittenberg

R. E. Dunn

D. E. WHITTENBERG, vice-president of sales for Garrett Oil Tools, division of U.S. Industries, Inc., Longview, Tex., has been assigned additional responsibilities assisting the president, and **ROBERT E. DUNN** has been named manager of marketing. Whittenberg will be responsible for executive office customer relations, will assist the president with general administration, and will serve as general manager of the division in the absence of the president. He has been with Garrett since its founding in 1946 and, before that, was associated with Guiberson Corp. and Sun Oil Co. Dunn, who will be in charge of the sales department, comes to Garrett from Cardwell Mfg. Co., where he has been assistant general manager since 1958. **J. T. Conner** has been promoted to the new position of field sales manager, with offices at Longview headquarters. He was formerly Garrett's South Louisiana district sales manager. In his new position, Conner will supervise all sales districts, including Garrett Oil Tools, Ltd. (Canada), and all domestic sales agents. **C. G. Phillips,** sales engineer in the South Louisiana district, will temporarily supervise that district. **R. V. McAfee** assumes the new position of manager of sales training. He will be responsible for establishing and conducting all sales training programs. He has been with Garrett since 1950, and will continue to be located at the Houston office.

BILL MARTIN becomes assistant zone manager in charge of warehouse operations at New Orleans for Milwhite Mud Sales Co. He joined Milwhite in 1955 as area manager in southwest Louisiana.

B. Martin

G. E. Nevill

G. E. NEVILL has been appointed engineer of standards in the product engineering department of the pressure control equipment division of Cameron Iron Works, Inc., Houston. He will represent the company on technical committees, including the American Petroleum Institute, the Assn. of Wellhead Equipment Manufacturers, and the Manufacturers Standardization Society of the valve and fittings industry. He will also assist in the preparation and review of technical papers and releases, and will assist in patent matters.

KENNETH W. CONNOR becomes division superintendent of the Rocky Mountain division at Casper, Wyo., for Loffland Bros. Co., one of the Kendavis Industries. Connor, who joined Loffland in 1937, has been assistant division manager in Casper since 1953.

P. E. TODD joins the rental tool department at Wilson Supply Co.'s Odessa (Tex.) store, and **J. M. (Pat) Patterson** becomes Odessa store manager. Both men were formerly field representatives for Wilson. Todd and **M. Thomas,** rental tool manager, will instruct customers in the Permian Basin in the use of the new Wilson Jet Junk Retriever, and other rental equipment.

CHARLES E. WILLIAMS has joined C. Lee Cook Co. as sales representative in the Tulsa Mid-Continent division, with offices in Amarillo, Tex. He was formerly a lubrication engineer for Gulf Oil Corp., at Midland.

HOWARD E. MIDKIFF has been appointed Tulsa area sales manager for Cal-Metal Pipe Corp. of Louisiana. Midkiff, who joined Cal-Metal in July, was formerly branch manager of H&H Equipment Co., in Tulsa. Before that, he was with American Coldset Corp.

M. D. Gilchrist

M. R. Schrein

R. E. Sutherland

M. D. GILCHRIST, M. R. SCHREIN, and **R. E. SUTHERLAND,** vice-presidents of Universal Oil Products Co., Des Plaines, Ill., have been elected senior vice-presidents. Gilchrist will be responsible for the commercial development of the company's process, Schrein for chemical research, and Sutherland for refining research. **F. O. Newton,** vice-president, has been elected to the newly created position of staff vice-president, and **B. J. Flock,** also becomes a vice-president.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT — BUSINESS EQUIPMENT — USED, OR RESALE

OPPORTUNITIES

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Wanted: Store manager for oil refineries and chemical plant supplier of pipe, valves, and fittings. Salary open. Central Ohio area. Reply to P-3478, Petroleum Week.

Wanted oil experienced sales managers, for new offices in Philadelphia, Pa.; Miami, Florida; San Francisco, California. The men we pick must be bondable and take interest in the corporation, and be able to operate and train salesmen. All deals furnished weekly by home office. Our employees know of this advertisement. All additional information furnished upon request. P-3535, Petroleum Week.

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The Antitrust Axe Is Heavy Indeed

SOHIO'S CHARLES E. SPAHR and Leonard's Reid Brazell were most disturbed to realize how easily the Justice Dept. can block a substantial business proposition merely by filing an antitrust suit.

It is not difficult to understand their sentiments.

Both men were confident that a court test would disprove the government's contention that the acquisition of the assets of Leonard Refineries, Inc., by Standard Oil Co. (Ohio) would "substantially lessen competition," or "tend to create a monopoly."

But being realists, they also knew that it would take years of costly, time-consuming legal procedures, including appeals and rebuttals, to win their point. This, they felt, would be eminently unfair to stockholders, customers, and employees of both firms.

Their reluctant conclusion was that the antitrust proceedings constituted such an expensive, frustrating barrier that they had no practical choice but to abandon negotiations and plans.

They found the adamancy of the Justice Dept. equally disconcerting. Spahr pointedly noted that Sohio had explored and exhausted every possible means of reducing the litigation time, before it felt compelled to scuttle the whole idea.

THE ANTITRUSTERS, he asserted, wouldn't even consider a consent decree that would have protected their position and, at the same time, have enabled the two oil companies to demonstrate, by actual operations, that competition would be increased rather than lessened.

It is a sad commentary, for this business proposition wasn't settled on its merits. It was nullified by the dictates of business economics and practical considerations stemming from the many problems involved in an antitrust proceeding.

This is the second time in recent months that a major petroleum expansion has been blocked by Justice Dept. objections. Last fall, Texaco Inc. jettisoned its plans to acquire Superior Oil Co. when the government threatened to step in.

This proposal went by the boards even though many people agreed that, from a business standpoint, it made sense, and would have been a good marriage for both partners.

THE JUSTICE DEPT. has every right, of course, to look into any and all mergers, acquisitions, and similar deals. But the antitrust lawyers should remember at all times that the axe they swing is heavy indeed. Whether it bites into wood or merely slices through the air, the net effect can be the same.

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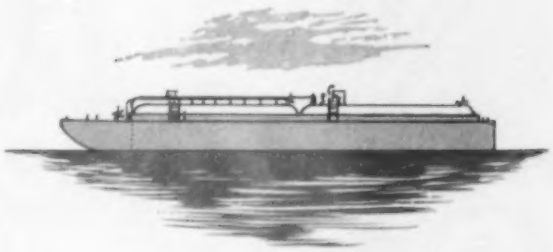
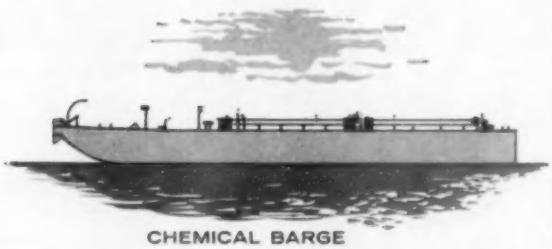
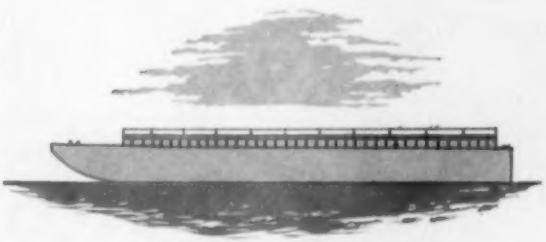


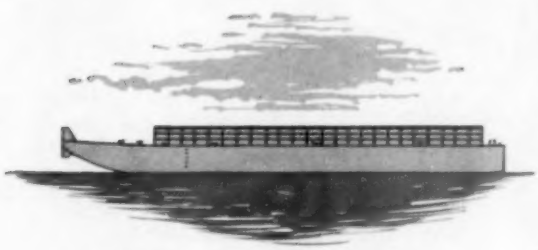
TANK BARGE



CHEMICAL BARGE



COVERED HOPPER BARGE



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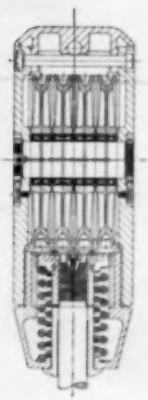

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